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THE
IRRIGATION TREATMENT
OF
G O N O R R H Œ A
ITS
LOCAL COMPLICATIONS AND SEQUELÆ

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THE GENERAL PRACTITIONER, more particularly he who labors in the smaller communities, must be a specialist in all branches of medicine. The demands upon his waking and sleeping hours are usually so great that time is not his for extensive literary research or for the study of exhaustive theoretical volumes.

Herein lies the motive for the present effort of the writer to offer as concisely as possible the essential facts in connection with the treatment of gonorrhœa, and to place before the busy practitioner the results of his experience.

The General Practitioner, who conscientiously exercises his power to benefit mankind, must treat gonorrhœa when called upon to do so ; and he must treat it in a manner that will protect his patients and the public from the consequences of this disease. Furthermore, it is the work of the General Practitioner which forms the firm foundation upon which the superstructure of medical specialism is built ; therefore,

TO
THE GENERAL PRACTITIONER
THIS LITTLE BOOK
IS FRATEERNALLY DEDICATED

INTRODUCTION.

THE larger and better works on genito-urinary diseases fully discuss gonorrhœa. Unfortunately none of them, except the master-work of Guyon,¹ makes much more than casual mention of the irrigation treatment of this ever-prevalent, painful disease, which when empirically treated is likely to be fraught with most disastrous consequences.

It is the purpose of this little book to fill the hiatus, until abler pens supply the missing chapter in new editions of their works.

¹ Guyon : *Leçons cliniques sur les Maladies des Voies urinaires*, troisième édition, Paris, 1894.

THE IRRIGATION TREATMENT OF GONORRHŒA.

GENERAL CONSIDERATIONS.

GOLDBERG¹ was the first to subject the results of the irrigation treatment of gonorrhœa to mathematical tests. He summed up the publications of all who had written favorably or otherwise on the method, and showed that these reported:

60	per	cent.	of	acute	gonorrhœas	cured	within	10	days,
30	"	"	"	"	"	"	"	"	14 days,
10	"	"	"	"	"	"			were not cured.

Of the last mentioned—one-tenth of the cases—the failure was clearly attributable in one-half of them to indulgence in alcohol and coitus, and the remaining five per cent. were not explained. These failures in the hands of such authors will probably find their explanation in those rapid invasions of the urethral adnexa which will be considered later on in discussing the complications of gonorrhœa.

At all events, no method of treating gonorrhœa offers as many scientific grounds for its employment, and not another can show *ninety per cent. of cases cured within fourteen days.*

That a large number in the profession appreciate this is shown by the following facts:

In 1894 not a dozen men in the world were using the irrigation treatment in gonorrhœa. Many had attempted and discarded it, owing to defective apparatus; others had obtained negative or unfortunate results, owing to faulty technique. In face of the adverse criticisms these conditions provoked, it

¹Goldberg: "Die Behandlung der Gonorrhœe mit Ausspülungen von übermangansaurem Kali." Centralblatt für die Krankheiten der Harn- und Sexual-Organen, Band vii., Hefte 3 und 4.

required commendable courage on the part of Felicke of Budapest, Janet of Paris, E. R. W. Frank of Berlin, and Swinburne of New York to persist in a method in which then, they alone succeeded.

Some time before, I was convinced of the results obtainable and of the opportunities offered for advancing gonorrhœa from its empiric therapeutic chaos. It seemed to me that if the profession at large were offered an apparatus by which irrigations might be easily and correctly performed, the advantage to science and to patients would be more readily appreciable. There is no purpose in reciting the evolution of the apparatus. It will suffice to describe herein the last result of six modifications, the one now used.

The middle of 1899 shows about six thousand physicians in the United States alone, using the irrigation method, erroneously called the "Valentine method," of treating gonorrhœa. I did nothing except devise a simple apparatus, develop the technique, modify the medications, render the rules precise, and write many articles, carefully weighing the advantages and avoidable disadvantages of the irrigation treatment.

I. THE IRRIGATOR.

This apparatus consists of a board (Fig. 1, *a a*) with a brass rod attached (*g*). Readily sliding upon the brass rod is a metal block, connected by a strong bar to a collar (*c*). This firmly holds a percolator (*h*) of a capacity of 1,000 c.c. (about one quart). The opening that interrupts the completeness of the collar permits easy removal of the percolator when required. The nipple of the percolator is inserted into a soft-rubber tube (*i*) seven feet long. The distal end of this rubber tube is passed through a stopcock, whose essential parts are a ring (*j*) for admission of the fourth finger; a sliding flange (*k*) to increase or decrease the pressure of the fluid; a shield (*l*) to catch the fluid that spurts from the urethra and divert it into a basin held by the patient; a small ring (*m*) to suspend the stopcock when not in use. Fig. 1 shows a urethral nozzle (*n*) inserted into the rubber tube, projecting through the stopcock.

The board has brass plates above and below perforated for

screws, by means of which the apparatus is attached to the wall. At *f*, in Fig. 1, a hook attached to the lower end of the board is shown. This hook holds a ring at the end of a stout cord. The cord passes over a pulley (*d*) and is fastened to the travelling block mentioned before.

The variations of pressure required for anterior and intravesical irrigations are accomplished by the action of the right thumb and index finger on the stopcock, and not by variations in the height of the percolator. Its elevation is always the same; it is lowered only for the purpose of filling or cleaning.

Reference to Fig. 1 shows too clearly to merit further study, the manner in which the parts of the apparatus are put together.

Experience has demonstrated that when the top of the irrigator board is attached to the wall at an elevation of nine feet from the floor, sufficient pressure is obtained for all purposes. With increasing experience the physician finds that seven and one-half feet elevation suffices.

It will be found convenient to devote a little study to the stopcock and nozzles, despite their simplicity.

If the *stopcock* is taken in the right hand, and the fourth (ring) finger passed through the large ring on the metal tube, the thumb and index finger will easily reach and control the flange. On pushing it forward it compresses the clips, narrow-

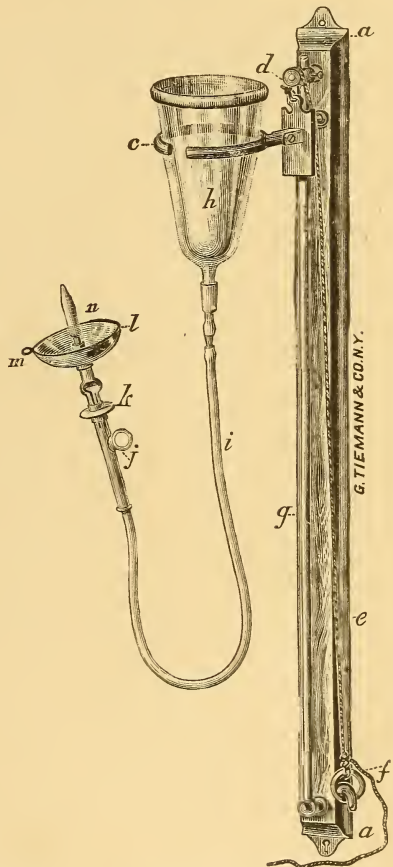


FIG. 1.—Author's Urethral and Intravesical Irrigator.

ing or even closing the lumen of the rubber tube; on drawing it back, the rubber tube resumes its entire calibre. One or two efforts will teach the physician to allow single drops to escape

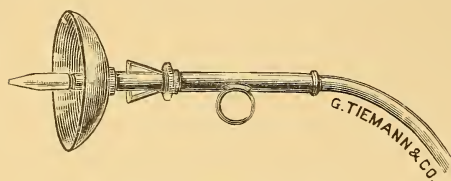


FIG. 2.—Author's Stopcock.

from the nozzle. By gradually drawing back the flange the stream is increased until a strong jet carries over six feet. All variations in the flow, from mere drops to strong jet, are accom-

plished with the percolator raised to its greatest height, nine feet from the floor. The value of so controlling the flow by slight contraction of the thumb and index finger will become more evident on considering the technique of irrigations.

The *nozzles* are of glass that can be easily sterilized. Their shapes are shown in Fig. 3. *A* is a pointed nozzle, for irrigating a normal meatus. It is important that the irrigating fluid have as easy exit as it has entrance into the urethra. The point of this nozzle allows washing the entire urethra and the meatus as well.

B is a dome-shaped nozzle devised to accomplish anterior and posterior irrigations without changing the nozzle, when a meatus is congenitally very large or has been made so by meatotomy.

C is a blunt nozzle for use when a congenitally very small

(pin-point) meatus would otherwise prevent irrigation, or when the normal meatus is so swollen as to prevent the introduction of nozzle *A*. Its orifice then is merely pressed against the meatus and the stream so directed through it into the urethra.



Nozzle A for normal meatus.



Nozzle B for large meatus.



Nozzle C for small meatus.



Nozzle D for female urethra.

FIG. 3.—Glass Nozzles.

D is devised for irrigations of the female urethra and bladder. Its shape is the same as nozzle *A*; its length, however, is three times greater. The reason for its increased length lies in the fact that all females must be irrigated in the recumbent posture, and for the protection of the thighs from soiling with the irrigating fluid as well as for self-evident anatomical reason, the shield must be brought down between the thighs. If the nozzle were as short as the others, the shield would prevent it coming into contact with the meatus.

Attachment of Nozzles.—The nozzle appropriate for the size of meatus being selected with sterilized fingers, its tubular end is easily inserted into the rubber tube projecting through the

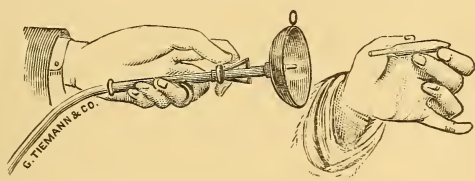


FIG. 4.—Manner of Attaching a Nozzle.

stopcock. After the tubular end of the nozzle is firmly inserted, the rubber tube should be drawn backward until the shoulder of the nozzle is arrested by the metal projection of the stopcock. This then holds the nozzle firmly, making it practically one piece with the stopcock.

As this book may fall into the hands of one or another practitioner not especially so endowed that he readily grasps mechanical ideas, I have thought well to be explicit, even to verbosity, in the above directions for use of the stopcock and nozzles.

Another form of this irrigator was modified from suggestions submitted to me by M. Wocher & Son, of Cincinnati. The illustration shows that in this apparatus a metal bracket takes the place of the board previously described. The rubber tube expanded and reinforced will not slip out of the stopcock, and therefore requires no nozzle or closing of the clips to retain it. A supplementary bracket (*s*) receives and holds the percolator when it is let down to be filled. The graceful form of this irrigating apparatus appeals to many practitioners, especially those to whom economy in office space is an object.

Care of the Irrigator.—Despite the simplicity of the apparatus

it, like any other, would not only become unsightly, but its utility destroyed by uncleanness.

To preserve the apparatus and to have it always ready for work, it will be well to observe the following rules:

1. When not in use, keep the flange of the stopcock well drawn back, so as to have no compression whatever of the rubber tube.

2. When the first described form of irrigator is used, keep a clean nozzle inserted in the rubber tube to prevent the tube slipping out of the stopcock. Its shoulder will hold the rubber tube in place. With the bracket irrigator, as mentioned above, this precaution is not necessary.

3. To prevent the formation of angles in the rubber tube, which would eventually cause it to break, and to reduce the strain upon the part of the tube into which the percolator's nipple is inserted, hang the stopcock mounted as above described, by its small ring upon a cup-hook conveniently placed for the purpose.

4. Thoroughly wash the irrigator each time after it has

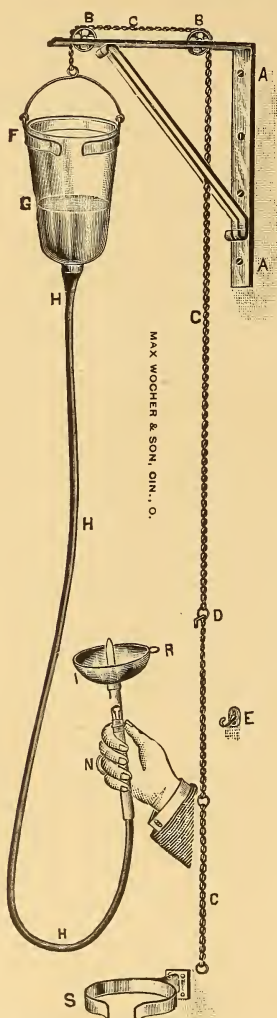


FIG. 5.—Modified Bracket Irrigator.

been used. Ordinarily it will suffice to let hot water run through it several times. Although the percolator may not be visibly stained, it should be remembered that permanganate of potassium tends quickly to destroy the rubber tube. It will be preserved almost indefinitely if this rule is observed.

5. Should the percolator become soiled, let a strong solution of oxalic acid run through it. If this does not suffice, use the oxalic solution on cotton mops to rub out the stains. Fill the percolator at least three times with clean hot water after using oxalic acid, lest some remain and be accidentally injected into the urethra or bladder.

6. After each use wash all parts of the shield with soap and hot water, rub it with cotton soaked in bichloride 1:1,000, dry it and hang upon its hook. This precaution will prevent the possible carrying of infection to another patient. While it is true that the majority of cases irrigated have gonorrhœa, there

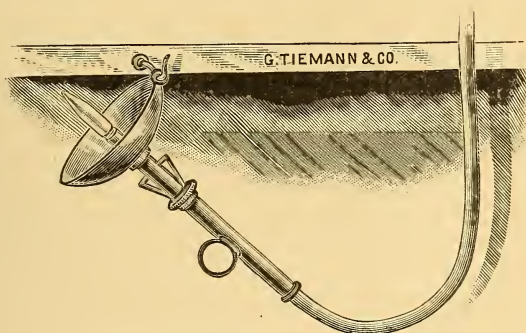


FIG. 6.—Manner of Suspending Stopcock.

is no reason for the physician to expose them to new infection. On the other hand, many patients needing irrigations are not gonorrhœal, as, for example, cases requiring urethral or vesical instrumentation or cases of contracted bladder. They certainly should not be exposed to gonorrhœal infection which can be avoided by the simple precautions of cleanliness.

7. It would be criminal negligence to subject any patient to the danger of infection by using a nozzle that has been employed in the previous case. This danger is easily avoided by the following steps:

(a) Immediately after irrigation hold the shield with the used nozzle still in place, under boiling, running water.

(b) Remove the nozzle and place it into a strong bichloride solution, kept ready in a glass dish for that purpose.

(c) When the day's office work is done, boil all the used nozzles for ten minutes in strong caustic soda solution.

(*d*) After boiling, place the nozzles in a strong (1:1,000) bichloride solution, kept in a covered glass or china dish reserved for sterilized nozzles.

(*e*) Rinse each nozzle again in clean hot water before using.

(*f*) While the steps described in *a* to *e* suffice for the sterilization of nozzles, it is not amiss to take extra precautions when a syphilitic has been irrigated. In a large practice where many nozzles are used, it is well to break the nozzle after employing it on a case with lues. If economy prompts keeping such nozzles, each one should be boiled separately and kept in a test tube filled with mercuric bichloride, 1 to 1,000. The test tube may be closed with a rubber cork, marked with a number or letters to designate the patient for whom the nozzle is used.

The indications for irrigations, their technique, and the solutions employed will be considered under the special heads where they properly belong.

II. ACUTE ANTERIOR GONORRHŒA.

In intromission during sexual intercourse the lips of the meatus are more or less pressed apart, causing the meatus to gape. On each withdrawal the lips are pressed together by the same vaginal pressure that pressed them apart on insertion. This gives the meatus a motion which may be compared to the opening and closing of a fish's mouth when feeding. If the vagina harbors gonococci, and if the penis is part of a body with lowered resistance, the infection, however reduced in the female, will find a new culture ground in the male urethra.

In contravention to this it may be offered that gonorrhœa most frequently affects men in the best possible physical condition. It is equally true, though, that men in full vigor are the most likely to expose themselves to venereal infection.

Again, a number of persons appear who contracted gonorrhœa without intromission, such as, for instance, when emission of semen took place before the penis could be inserted into the vagina. These are easily explained by the fact that the female urethra and Bartholini's glands are a very frequent site of residual gonorrhœa.

Extra-genital gonorrhœa, *i.e.*, its acquisition otherwise than

from an infected female, as for instance from a water-closet, is improbable, unless a man with an immense meatus were to recklessly smear it over the seat upon which gonorrhœal discharge had been left by another. Taylor¹ says that the acquisition of gonorrhœa on a "foul privy or urinal may be looked upon as a euphemism to be used in the case of some clerical, venerable, or married transgressor."

One distinct case of extra-genital gonorrhœal infection, however, came under my observation in 1897. A gentleman had contracted gonorrhœa fifteen years before. The case was persistent and followed by stricture, for which his physician used sounds. These had been discontinued for several years. The patient had for five years been engaged in severe mental labor, during which, as happens under such circumstances, he experienced no sexual desire. A few months before being sent to me he became engaged to be married. He had forgotten everything connected with his former gonorrhœa and stricture. Two months before the day set for his wedding, this gentleman, while in the rooms of a friend, saw a sound lying on the washstand. It was a 30 F, the same number he had last used. To ascertain whether his urethra had preserved its calibre, he essayed introduction of the sound into his own urethra, and found no difficulty in doing so. Three days later he had all the evidences of acute gonorrhœa. If this patient's veracity were not beyond dispute, the etiology of his attack might have been questioned. An examination of his discharge showed distinct gonococci grouped within pus corpuscles, attached to epithelia and disseminated between them. The friend whose sound was borrowed had no discharge, but *ramonage* of his urethra proved that it contained gonococci.

Some time later the *Centralblatt für Krankheiten der Harn- und Sexual-Organen* contained a report made by the patient (a physician) to show an extraordinarily long period of incubation of gonorrhœa—three weeks. The manner of infection is equally interesting. The doctor had taken a specimen of a fresh gonorrhœal discharge for microscopic examination. Through carelessness he had soiled his fingers with the discharge. Being suddenly seized with a desire to urinate, he quickly took his

¹ Taylor: The Pathology and Treatment of Venereal Diseases, 1895.

penis from his garments, and in doing so communicated some of his patient's discharge to his own meatus. The result was a fully developed gonorrhœa.

There doubtless may be similar cases of extra-genital infection, still they are exceedingly rare. At all events, when asserted, it can do no harm to give the patient the benefit of the doubt.

When gonococci have entered the meatus, they at once proceed to proliferate by segmentation. At any time between twenty-four hours and nine or ten days post coitum, the lips of the meatus are reddened, swollen, and a watery oozing presents. This soon becomes successively whitish, white, whitish-yellow, yellowish, yellow, yellowish-green, and later on possibly stained with blood. With deepening of the color the discharge becomes more copious and thick.

The other symptoms of acute anterior gonorrhœa merit attention. White and Martin¹ hold that even preceding the first slight puffing of the meatus, the patient experiences a constant desire to handle and examine the penis. I believe that this is not likely to occur except in those patients who have had gonorrhœa before, or in married men who have had illicit intercourse. This direction of the patient's mind to his penis may be due to that "conscience does make cowards of us all."

Coincident with or shortly before the first slight tumefaction of the meatus, there may, however, be a tickling in the affected region. This is soon followed by a sense as if the urine were very hot. Replying to the irritation caused by the increased number of the gonococci seeking more food in the urethral mucosa, nature tries to wash away the disturbance by increased urination and increased secretion of urethral mucus. The patient, yielding to the more frequent calls to urination, experiences intense scalding and cutting pain with each act. When the gonococci have caused the destruction of the mucosa in spots, the pain on urination becomes intolerable, to subside only after the gonococci have exhausted their food supply of mucosa, or when the nerve terminals are protected by tissue hyperplasia.

¹White and Martin: Genito-Urinary Surgery and Venereal Diseases, Lippincott, 1898.

Coincident with the irritation, the urethra and its adjacent tissues are the site of blood afflux. Its results will be considered under the complications of acute gonorrhœa.

As the pains on urination grow more severe, the first 50 to 100 c.c. (fl \bar{z} ii. to fl \bar{z} iii.) become turbid. Caustic potash added to this urine shows it to be laden with pus. The pain may, however, be entirely absent or may, in severe cases, continue even between the intervals of urination.

This mere outline of a sketch of the development of a clap premises its arrest at or before the compressor, *i.e.*, when it remains an uncomplicated anterior gonorrhœal urethritis. That it rarely does so is only too evident to physicians who give the subject careful attention.

Many text-books advocate "waiting for the acute stage to pass off." This waiting unfortunately allows the gonococci to increase, the infection to invade the tissues more deeply, to proceed beyond the compressor, to develop local complications, to involve other organs, and to make a life-endangering disease of what should have been arrested in its incipency.

So far as our present knowledge goes, the end in view is best attained by irrigations, employed as early as possible. How the irrigations exercise a beneficial effect may be subject to honest differences of opinion.

Potassic permanganate, the drug most frequently employed for the purpose, is held to liberate oxygen in the tissues; if the gonococcus is an anaërobic microbe, it would die in the presence of oxygen. Then irrigations of hydrogen peroxide should have a more prompt effect, which, however, is disproven in practice.

The theory that seems most acceptable is that the large volumes of hot water (110° to 120° F.) employed induce a species of artificial œdema of the urethra, making it an unfavorable culture medium for gonococci. At all events, it is nothing rare to find the heavy greenish or bloody discharge, the frightful pains on urination, converted into a mere watery excess and painless, normal urination after one or two irrigations. Even if the course of the disease were not abbreviated and complications avoided by irrigation, these two results alone would justify ardent advocacy of this method of treatment.

III. ANTERIOR IRRIGATIONS.

Irrigations of the anterior urethra are employed:

1. In infection of the anterior urethra;
2. After any instrumentation of the anterior urethra, whether for diagnostic or therapeutic purposes. Since making it an invariable rule to irrigate the urethra even after urethroscopy, I have had not a single case of urethral fever to record.

The technique of anterior irrigations may be divided into preparation of the patient and the performance of the irrigation itself. Their necessarily detailed description may make them appear complicated and difficult; their proper execution, however, is simple and easy. The time they consume never extends over five minutes, even with a very sensitive or apprehensive patient receiving his first irrigation. As soon as the patient has learned the painlessness of a gentle, properly executed irrigation and has experienced the relief it affords him, he becomes the physician's active coadjutor in further treatment.

Preparation of the Patient.—After the record of the case is written, a specimen of the discharge taken for microscopic examination, and the urine examined, the patient is instructed:

1. To drop his trousers to his knees.
2. To fold his shirt and undershirt upward, exposing the abdomen.
3. To sit on a chair with a firm, strong back, in such a position that his weight does not rest upon the tuberosities of the ischium but upon the sacrum; in other words, he is placed as far forward as possible upon the front margin of the chair.
4. To rest his shoulders against the back of the chair.
5. To plant the soles of his feet firmly upon the floor.
6. To direct his face upward, toward the ceiling. It is well always to give this last instruction, lest a patient with a malodorous breath discover that an invidious distinction is made in his case. This position serves the good purpose of saving the physician the unnecessary disagreeable knowledge that would otherwise interfere with his work.

When the bad odor of the breath is due to digestive disturbance it should be remedied by appropriate treatment as quickly

as possible, so that no other condition may reduce the patient's resistance to further invasion of the gonococci.

7. If the physician is not experienced in irrigations, it is well to protect the patient's garments with a large rubber apron, made for the purpose with a hole for the penis.

8. A pan or bowl of tin or agate ware is then washed, inside and out, in hot running water and then wiped dry. It is well to



FIG. 7.—Posture of Patient for Irrigation in Recumbent Position.

do this before and after each irrigation, and in such a manner that the patient must observe the precaution; it aids in keeping his attention fixed upon the need of taking every care against infection of others and of auto-reinfection.

9. A clean towel is placed upon the patient's lap and drawn up to cover his testicles, but not his penis.

10. The basin, still warm from its cleansing in hot water, is placed upon the towel, and the patient is told to hold it with both hands. The penis is laid upon the margin of the basin

and the latter slightly tilted, so that the rim upon which the penis lies encroaches upon the peno-scrotal juncture.

Excessively nervous patients may be inclined to faint on merely receiving the above instructions. It is well to irrigate such patients in the recumbent posture. For this purpose place a bidet or irrigating pan upon the operating-table. Draw the patient's linen well up to beyond his lower ribs, and his trousers and drawers down to below his knees. Let his buttocks rest far back on the pan, to leave as much of it exposed as possible. Place a tin bowl between his knees, tilted with its concavity upward, so that any untoward motion on his part sending the irrigating fluid beyond the shield may be caught by the bowl and directed into the pan upon which he lies. The irrigation may then be made as easily as when the patient is seated, and without danger of his fainting.

In very exceptional cases, perhaps once in a thousand, a patient is found who unconsciously responds to irrigations by a relaxation of the compressor. The consequence is that the fluid intended for anterior irrigation enters the bladder. When a very strong solution (such as potassic permanganate, 1 : 500) is used, a very severe vesical tenesmus at least is induced thereby. In such cases it is best to irrigate the patient in the standing posture, and to teach him to press his fingers upon the perineal portion of the urethra to occlude it.

Technique of an Anterior Irrigation.—1. Stand at the patient's right side.

2. Cleanse the penis, foreskin, glans, and meatus with cotton tampons soaked in mercuric bichloride, 1 : 3,000. If it is preferred to accomplish the cleansing with the irrigating solution; then

3. Take the stopcock in the right hand as shown in Fig. 4, page 5, and for additional safety pass it under running boiling water, into which a small quantity of the irrigating fluid should be allowed to escape; then close the flange.

4. Take the penis in the left hand, holding the left corpus cavernosum by the third, fourth, and fifth fingers in such a manner that their tips rest lightly upon the urethra. The left thenar eminence, by being pressed inward, compresses and almost grasps the right corpus cavernosum. The bent thumb and index finger are thus left free for manipulation of the foreskin,

glans, and meatus. This manner of holding the penis will at a first effort appear to cramp the hand, but after two or three irrigations it will be found the most effective and easiest.

5. Gently draw the flange of the stopcock back by contracting the right thumb and index finger. This will allow a fine stream to escape from the nozzle. Direct this stream to the outer surface of the foreskin until all its parts are thoroughly cleansed.

6. Increase the stream slightly while directing it to the opening of the foreskin. With the left thumb and index finger slowly evert the foreskin and, as its mucous lining is thus being exposed, wash each part as it comes into view.

7. When the entire foreskin is retracted, wash the sulcus behind the corona, the glans, the sulci at either side of the frenum, and the



FIG. 8.—Manner of Holding Penis for Irrigation.

lips of the meatus in the same manner. When the foreskin is so tight that it cannot be everted, drop the penis and take up the top of the foreskin with the left thumb and index fingers. This will leave the opening of the foreskin slightly gaping. Insert the nozzle into the opening of the foreskin and increase the force of the stream until the preputial pouch is thoroughly ballooned. Give the tip of the nozzle every possible direction, so that the pouch may thus be as effectively cleansed as possible.

8. After cleansing the foreskin, glans, etc., and holding the penis as shown in Fig. 8, above, contract the thumb and index finger upon the glans, so as to open the meatus.

9. Direct the stream at first gently and then with increasing force into the opened meatus, until all visible excess of secretion is washed from it.

10. Bring the nozzle closer and closer to the meatus until its point is within the lips.

11. Compress the urethra with the tips of the left third, fourth, and fifth fingers, to entirely occlude it.

12. Augment the force of the flow until the fluid spurts from

the meatus in such a manner that it is received by the shield and flows from it into the basin held by the patient. The impact of the fluid is felt against the tip of the middle finger, where it compresses the urethra.

13. When one-fifth of the contents of the percolator are consumed in the irrigation of the anterior third of the anterior urethra, the middle finger is relaxed and the fluid's impact is immediately felt upon the tip of the fourth left finger that compresses the urethra.

14. The same procedure is successively observed regarding the urethra compressed by the fifth left finger, and the impact of the fluid, with increased force, is sent to the bottom of the anterior urethra, *i.e.*, to the anterior surface of the mucosa in front of the compressor.

During every step of an anterior irrigation enough force must be used to fully dilate (balloon) the urethra. The nozzle should never occlude the meatus entirely, especially when strong solutions are used, lest they be forced beyond the compressor into the bladder.

The division of the amounts of fluid used for each part of the urethra will soon become so much a matter of routine that the operator need not observe the percolator to guide him.

After each irrigation a layer of absorbent cotton soaked in mercuric bichloride, 1:6,000, should be placed upon the glans to receive any subsequent discharge, preventing as far as possible auto-reinfection, and to keep the clothing clean. If the foreskin is absent or too small to hold the cotton, it should be fixed in place by means of a light gauze bandage. The patient should be instructed to apply a clean piece of cotton soaked in bichloride after each urination.

Some cases are exceedingly susceptible to the irritant effect of mercuric bichloride, even a solution of 1:10,000 or of 1:30,000 sets up an inflammation of the glans. Boric acid, four per cent., may be used in such cases to wet the cotton.

The cotton used as above must not be substituted by anything else. Gonorrhœa-bags and condoms, so often advised for the purpose, keep the glans macerated in pus, not only inviting persistent auto-reinfection, but also exposing the glans to gonorrhœal balanitis, for whose existence there is no excuse.

Some authors recommend a little apron made of linen or

gauze, cut about two inches square, with a slit in the centre to let the glans pass through. The ends of the apron are then folded forward to cover the glans and meatus. If the patient be sure to take off this apron each time he urinates and replace it with a fresh one, its convenience might make it advisable to a degree. But it is entirely too convenient merely to open the ends, urinate and replace the soiled ends over the glans. Moreover, the ends are easily brushed open and thus the garments

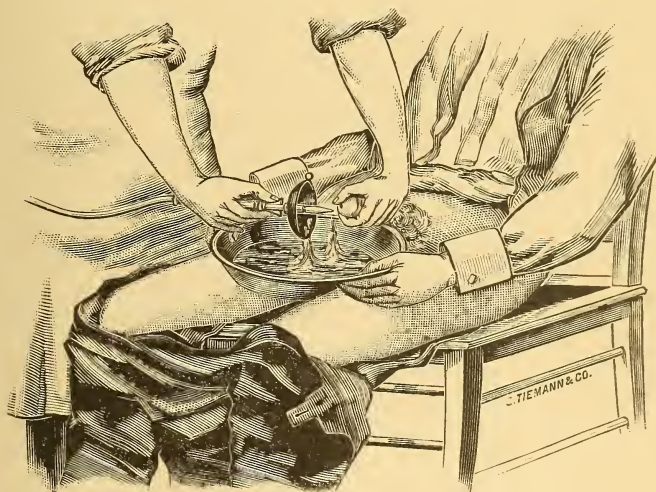


FIG. 9.—Anterior Irrigation, Patient Seated. Towel over thighs omitted for clearness of illustration.

are exposed to being soiled by the pus. For these reasons it is best to use absorbent cotton, as above suggested.

All parts of an irrigation can, without any special dexterity, be so conducted that neither the patient's garments, his person, nor the office floor be soiled. Nothing need be stained, except the operator's left fingers, when using strong solutions of potassic permanganate. They can be quickly cleaned with oxalic acid or sodic bisulphide.

As cleanly as an irrigation should be, so painless it is when properly carried out. Even an intensely inflamed urethra experiences no pain if the operator is sufficiently gentle. In this, as in all other genito-urinary work, *suaviter in modo* occupies first place; *fortiter in re* need not at all suffer thereby.

For this reason analgesia of the urethra with cocaine or eucaine need not be induced. Moreover, when their obtunding effect wears off, the patients experience more pain than if they had not been used at all.

The time consumed by irrigations has been alleged as an objection to their employment. A deliberate, properly conducted anterior irrigation requires about two minutes, certainly not too much time to devote in each visit to so important a disease as anterior gonorrhoea. If only relief from suffering were obtained thereby, even ten times two minutes would be well employed. But the physician, knowing how dangerous to life gonorrhoea is, should not begrudge any amount of time and labor directed to this end. Even if the disease was acquired in the grossest immorality, even if the patient is of the lowest, most degraded type, it is unqualifiedly the physician's duty to give the best efforts in order to prevent the dissemination of the disease to others who may possibly be innocent of any wrong.

The frequency with which irrigations should be employed in acute anterior gonorrhea is set forth in the following table. The solutions referred to therein are of potassium permanganate, —the drug most frequently used by all who employ irrigations. The dilutions are modified from those advised in Janet's tables, which, for some reason, seem too strong for use in this country. It will be observed that intravesical irrigations appear in this table. The technique of these will be described in Chapter V. (Intravesical Irrigations):

First day, first visit.	Anterior irrigation.	1 : 3,000
First day, 7 P.M.	Anterior irrigation.	1 : 4,000
Second day, 9 A.M.	Anterior irrigation.	1 : 3,000
Second day, 7 P.M.	Anterior irrigation.	1 : 4,000
Third day, 9 A.M.	Intravesical irrigation.	1 : 6,000
Third day, 7 P.M.	Anterior irrigation.	1 : 5,000
Fourth day, 9 A.M.	Intravesical irrigation.	1 : 5,000
Fourth day, 7 P.M.	{ Intravesical irrigation.	1 : 5,000
	{ Anterior irrigation.	1 : 2,000
Fifth day, noon.	Intravesical irrigation.	1 : 5,000
Sixth day, noon.	Intravesical irrigation.	1 : 5,000
Seventh day, noon.	Intravesical irrigation.	1 : 5,000
Eighth day, 9 A.M.	{ Intravesical irrigation.	1 : 5,000
	{ Anterior irrigation.	1 : 3,000
Eighth day, 7 P.M.	{ Intravesical irrigation.	1 : 5,000
	{ Anterior irrigation.	1 : 2,000

Ninth day, 9 A.M.	{ Intravesical irrigation	1 : 4,000
	{ Anterior irrigation	1 : 1,000
Ninth day, 7 P.M.	{ Intravesical irrigation	1 : 4,000
	{ Anterior irrigation	1 : 1,000
Tenth day, 9 A.M.	{ Intravesical irrigation	1 : 4,000
	{ Anterior irrigation	1 : 1,000
Tenth day, 7 P.M.	{ Intravesical irrigation	1 : 5,000
	{ Anterior irrigation	1 : 500

The hours at which irrigations are to be administered have been fitted to the exigencies of most physicians' office hours. It would be always preferable, however, when irrigations are to be given twice in one day, that they be made twelve hours apart.

IV. ACUTE POSTERIOR GONORRHŒA.

De Keersmaecker and Verhoogen¹ in brief remarks on acute posterior gonorrhœa, say: "The inflammation proceeds along the whole urethral mucosa, but its intensity decreases generally in accord with its distance from the point where the inoculation was produced, as is observed in every local infection." It seems, however, that posterior gonorrhœal invasion is an exception hereto. The gonococci having traversed the compressor find a new field of culture in the posterior urethra. They often set up an inflammation far exceeding in virulence that which affects the anterior urethra. In many cases the patient's sufferings are not only materially increased, but, as Posner² says, "the portals for infection of other organs are thereby thrown open."

Jadassohn holds that sixty to seventy per cent. of anterior gonorrhœas invade the posterior urethra; Finger places the extreme figure at eighty per cent.; while Taylor³ claims that "anterior urethritis in between eighty and ninety per cent. of cases within the early days of infection passes backward and involves the posterior urethra." Close clinical study of the question makes it appear likely that even Taylor underestimates the frequency with which the posterior urethra is involved in the dis-

¹ De Keersmaecker et Verhoogen : *L'Urétrite chronique*, Brussels, 1898.

² Posner : *Diagnostic der Harnkrankheiten*, Berlin, 1894.

³ Taylor : *The Pathology and Treatment of Venereal Diseases*, Lea Bros. & Co., 1895.

ease. Indeed White and Martin' say that the gonococcus "with but few exceptions invades the posterior urethra."

Wossidlo² urges that no apparently cured case of acute gonorrhœa be dismissed without examination of the prostate, although the posterior urethra does not seem to have been affected. The absence of symptoms of posterior urethritis is no proof that the posterior urethra was not infected by the gonococci on their way to the adnexa.

Causes.—Anything that decreases the vital resistance of the posterior urethra, menaced by the presence of anterior gonorrhœa, and increases the intensity of the latter, is likely to produce posterior gonorrhœa. Among the most frequent causes are neglect of treatment, coitus, irritants applied to the urethra, alcohol, fermented or carbonated beverages, and excessive activity.

Time of Invasion.—A neglected or badly treated anterior gonorrhœa usually invades the posterior urethra by the end of the first week. The patient, however, may perceive no symptoms thereof until the end of the second week. A few days later the evidences are often too marked to escape attention.

Posterior gonorrhœa may, on the other hand, become painfully manifest at the very beginning of the disease, especially if strong injections, violently applied, increase the irritation. This may convey to those not familiar with the irrigation treatment, a condemnation of its employment. But it must be remembered that the irrigations applied to the entire urethra are not strong; moreover, they so modify the urethral mucosa as to make it an unfavorable culture medium for gonococci. This in a measure explains the absence of posterior gonorrhœa when irrigations are properly employed.

Some authors mention the use of bougies as a means of immediately establishing a posterior gonorrhœa. Naturally they do this only to condemn the insertion of any instrument into an acutely inflamed urethra. *Ipsè facto*, this is a condemnation of attempting to wash the urethra with a catheter or treat it with anthrophores.

Symptoms.—As noted above, very many cases of acute pos-

¹ White and Martin: *Genito-Urinary Surgery and Syphilis*, Lippincott, 1898.

² Wossidlo: "Chronic Prostatitis and Its Treatment." *Journal of the American Medical Association*, August 27th, 1898.

terior gonorrhœa are insidious in their onset, course, and decline. Most of these disappear without any special treatment being directed to the region infected. Indeed in former times the posterior urethra was deemed one of the "sacred regions" not to be entered by instruments or drugs, and yet many cases appeared to have recovered. How many of these subsided after carrying gonococci to the urethral adnexa and general organism is beyond calculation. The hope of those who strive to heal acute posterior urethritis by treatment of the anterior urethra alone, may be compared with that of the gynecologist who endeavors to drain pus-tubes by curetting, washing, and draining the womb. Both appear to succeed often; but as concerns posterior urethritis, the physician would fall short of his duty if he risked further complications by trusting to the chance that occasionally seems to have favored the past.

Mechanism of the Symptomatology.—In the insidious form, the very slight sufferings or their absence may not direct attention to the posterior urethra. In the severe form, nature endeavors to assuage the inflammation by free secretion of urine. Its contact with a surface rendered exquisitely sensitive produces intense burning. After the flow of urine has ceased, the inflamed surfaces fall against each other, and in so doing give the sensation of an incompletely accomplished urination. At the same time the folds of the thickened mucosa squeeze between them the delicate nerve terminals, producing the characteristic after-pains. When somewhat deep denudations have taken place, the capillaries may break, allowing blood to escape, which may be mixed with the last portion of the urine, may follow it as clear drops; or a distinct stream of blood may flow, or the urine may carry small worm-like clots, if blood coagulates in the posterior urethra.

The swelling of the mucosa and pain evoke frequent, almost continual spasmodic and semi-voluntary contractions as if in effort to eject the obstructions. This activity of the region increases the symptoms as it augments the inflammation. The vicious circle obtains another segment by each effort of nature to pour out urine. The latter becomes so frequent that the patient continually strives to empty his bladder, and while he fails to obtain a sense of relief, by acting upon the desire to urinate, he increases his pain.

As above suggested, there is no exact chronological order in which the manifestations of acute posterior urethritis follow each other. Indeed, they may all appear to come on together with extreme severity. For convenience in studying them a little more closely, they are here placed in alphabetical order.

Albuminuria.—When the urine carries pus, it accounts for the presence of a proportionate amount of albumin. In acute posterior gonorrhœa, when vesical tenesmus is at its highest, the amount of albumin carried by the urine exceeds that which would be expected from the amount of pus present. White and Martin¹ deem this excess “probably due to damming back of the urine in the ureters, dependent upon closure of the orifices of these canals by contraction of the detrusor muscles of the bladder; this having been shown to take place when tenesmus is severe.”

Complications.—Proximity and continuity of mucous surface render the prostate, seminal vesicles, and epididymides exceedingly susceptible to infection from posterior gonorrhœa. The epithelium covering the trigone, from its similarity in character to that of the posterior urethra, is also liable to the infection, but to a limited degree. The epithelium lining the body of the bladder, however, seems immune to gonorrhœal infection, except when a pre-existent disease has weakened its resistance, or when traumatism has been exerted upon it, as by the abuse of instruments.

Constitutional Symptoms.—When a patient with gonorrhœa suffers from loss of appetite, headache, constipation, marked mental depression, even to profound neurasthenia, and appreciable fever, the physician's attention is naturally directed to the probable invasion of the posterior urethra. These general symptoms may come on gradually or suddenly, and are as likely to occur in chronic as in acute anterior gonorrhœa. If given immediate attention, severe general suffering and more dangerous involvement of the urethral adnexa may be averted.

Discharge.—The tonic contraction of the compressor prevents the discharge of acute posterior gonorrhœa from entering the anterior urethra. When it is so copious as to fill the posterior urethra, the slight, weak bundle of fibres constituting the

¹ *Op. cit.*

sphincter vesicæ is more likely to yield to the pressure and so admit the discharge into the bladder. Even stripping the posterior urethra per rectum will not aid satisfactorily in the production of discharge from the posterior urethra, for the same reasons as given above. The only means of positively reaching conclusions regarding involvement of the posterior urethra, in addition to giving due heed to the other symptoms, is by examination of the urine (*vide* Urine *infra*). Naturally when the symptoms appear in the fulminant type, this aid to diagnosis is impossible and would be superfluous.

Emissions.—As abstinence from sexual intercourse is imperative during gonorrhœa, for the patient's sake as well as for the sake of those to whom the disease may be communicated by him, and as the local irritation of even an anterior gonorrhœa is prone to stimulate increased secretion of semen, seminal emissions are not infrequent. They occur especially in men who are given to daily sexual intercourse. When, however, posterior urethritis has produced hyperæsthesia of the caput gallinaginis, the emissions of semen may be exceedingly painful, the sufferings being either disseminated through the perineum, extending up to the rectum, or tearing and shooting along the posterior urethra. These pains are often so intense that the patient is afraid to fall asleep, lest he be awakened by an emission that would evoke their recurrence.

Erections.—Posterior urethritis is liable to provoke erections at all times, with or without erotic incitation. They are most frequent when warm in bed, but are painless unless there be acute anterior urethritis as well.

Hæmaturia.—Drops of blood, unmixed with urine, may escape from the urethra at the end of micturition. This is usually considered a positive evidence of posterior urethritis. While it most frequently occurs in this disease, it may also be present in some forms of bladder growths (polypus, papilloma) and stone. When due to posterior urethritis, the bleeding comes from the swollen, congested, and even eroded mucosa. If the bleeding is copious it may flow into the bladder and be mixed with its contents; then, too, some drops or a jet of clear blood will follow urination. In such a case the urine may also carry small, worm-like clots of blood.

Pain.—The pain of fulminant acute posterior urethritis is

usually most marked in the perineum. It is due to muscular spasm, provoked by the tenesmus. Its severity may be so great as to cause the patient to act as if afflicted with acute mania. Between the attacks of intense pain the patient may have tickling, burning, and sharp lancinations through the deep urethra, extending up the rectum. All these disturbances are aggravated by urination or defecation; they most frequently follow the act of urination.

Retention of Urine.—If the posterior urethra is very much swollen, the frequency of urination may suddenly be arrested and acute retention take its place. The sufferings that before were somewhat remittent then become continuous. The retention may become quite obstinate from the increase of swelling and reflex tonic contraction of the sphincters. (See also Complications of Gonorrhœa: Retention.)

Urination.—The slightest quantity of urine coming into contact with the inflamed posterior urethra provokes the desire to urinate. The patient must then micturate every few minutes. His straining to pass the few drops is accompanied by intense pain. Although passage of these drops gives no relief, the patient continues his efforts to urinate incessantly, being impelled thereto by the sense of vesical repletion. His only relief, when not treated, is in the few moments of sleep or fainting that exhaustion brings.

In a case that is not so acute as the one described, there may be no painful straining. But the urination is frequent and imperious. The desire when felt must be immediately gratified, otherwise the patient will urinate into his trousers.

Urine.—When acute disturbances of urination do not prevent examination of the urine, and when the other symptoms or conditions direct attention to the posterior urethra, the only method of reaching a diagnosis is by examination of the urine. Even when no suspicion guides to thoughts of posterior urethral invasion, the urine of a gonorrhœic should be examined daily, so that the extension of the disease may be met at its inception.

The examination should be made, if possible, of the first urine the patient passes in the morning. When this is not possible, because of the distance at which the patient lives from the physician's office, the examination may be made during the day, but after the patient has held his urine for at least four hours.

The patient should be caused to pass the first portion, about 150 c.c. (fl $\bar{3}$ v.) into a twelve-inch ignition tube.¹ This washes the anterior urethra as clean as possible, but naturally carries with it as much discharge from the posterior urethra as can be easily detached from its walls. The urine so emitted will therefore often be much more turbid than would be expected from a slight discharge.

The second 150 c.c. emitted into another tube, if the patient have posterior urethritis, will be found more turbid than the first portion. Naturally this symptom is not characteristic if the patient have cystitis or pyelitis, or when a disease of the prostate or seminal vesicles causes their contents to be expressed with the final efforts of micturition. In the absence of these diseases, and when the posterior urethra produces much discharge, it may flow back into the bladder and render its contents turbid. If the discharge is not copious, it will be carried off by the first urine, and leave the subsequent urine clear. Both urines, however, may be clear when the patient urinates frequently.

To cover the possibility of error in these cases, practitioners are ordinarily advised to wash out the anterior urethra by means of a soft catheter before allowing the patient to urinate. The greater ease and safety by which the urethra can be cleansed by means of anterior irrigations make the latter method preferable. By carefully exercising the technique of anterior irrigations (see page 12), and using warm boric-acid solution for the purpose, the anterior urethra can be quickly freed from any discharge it may at the time harbor. When the solution that spurts from the meatus is entirely clear of even fine granules, the patient should immediately urinate into two tubes. If the first tube contains pus and the second does not, the diagnosis of posterior urethritis is established with a fair degree of accuracy.

A better and not much more circumstantial test, especially applicable when the urine is not turbid, can be made by adding to the boric acid used for irrigation a quantity of methylene blue representing one per cent. of its quantity (twenty-four grains

¹ These twelve-inch ignition tubes are erroneously called "Valentine's urine tubes" by dealers. I did nothing but suggest the convenience of these tubes for macroscopic examination, comparison, and chemical and microscopical investigations of urine.

to the quart). If the urine passed into the first tube contains shreds, filaments, flakes, or granules which the microscope shows to be stained blue, it would tend to prove that they come from the anterior urethra. If they are not stained by the irrigation, their source is the posterior urethra.

The need of careful study and early treatment of posterior urethritis is evident, despite the fact that many of the cases appear to recover without treatment. Their tendency is to go over into a subacute or chronic state, to produce recurrent gonorrhœa, and to evoke a long list of neuroses which are often ineffectually treated until the source of the evil is ascertained.

Treatment.—As is quite natural, the treatment of acute posterior urethritis must vary in accord with the form in which it appears. If its onset is in the most insidious manner, so that its presence is determined only by examination of the urine, the safest, quickest, and easiest method of cutting it short is by intravesical irrigations, whose technique is fully detailed on page 29.

These intravesical irrigations may be performed once daily, beginning with potassium permanganate solution of 1:6,000; on the second day the strength of the solution may be increased to 1:5,000; on the third day 1:4,000 may be used and if no reaction result, a further increase to 1:3,000 may be employed on the fourth and subsequent days. Some patients' bladders will very comfortably bear much stronger solutions.

If in five or six days the urine does not indicate complete subsidence of the posterior urethritis, mercuric bichloride may be added to the potassic permanganate solution last employed. The addition of the bichloride should at first not be stronger than 1:50,000. On the second day this may be made 1:40,000; on the third day 1:30,000; on the fourth day 1:25,000. Only in very persistent cases can 1:20,000 be employed.

Some cases do better with the bichloride alone and in the solutions above indicated.

Occasionally a case will be found in which neither the permanganate nor the bichloride nor both in combination yield prompt effects. Then silver nitrate may be employed in solutions of 1:5,000, 1:4,000, 1:3,000, or 1:2,500, using the mildest on the first day and daily increasing the strength, but not beyond 1:2,500.

These irrigations, when properly conducted, are borne exceedingly well by patients; they experience an almost immediate relief from the slight subjective or reflex symptoms due to the insidious form of the disease under discussion.

When acute posterior gonorrhœa asserts itself in the fulminant form, the prime indication is to break the before-described vicious circle at some point. As in all acute inflammations, rest of the affected region must be sought.

Patients so affected should be kept in bed and on a diet of little else than skimmed milk. Mild laxatives, that keep the rectum clear and deplete the pelvic viscera, must be persistently given.

The one drug that gives signal relief in hyperacute cases is santal oil. As was shown by investigations made in Berlin in 1894 and 1895, santal oil cannot be expected to act as a gonococcicide.¹ It does, however, prove a decided analgesic of the urinary apparatus, and especially its lower part. To procure its effect as quickly as possible, it may be given in ten minim doses every two hours for six or eight hours. As soon as the tenesmus begins to subside and the bleeding after urination materially decreases, the intervals should be increased to four, five, or six hours, until pain has entirely disappeared. As this drug is prone to evoke renal irritation, it should be withdrawn as soon as the indications for its use have subsided.

The teas (infusions) of uva ursi leaves, herniaria, chenopodium, triticum repens, etc., which were formerly highly lauded for their presumed effects in such cases, have proven ineffective in my hands. They only augment diuresis, and in doing so increase the activity of the inflamed parts, that should be kept at rest. Salicylate of sodium and salol, which often show such favorable results in cystitis, prove utterly inactive in acute posterior urethritis.

When the attack is so severe that the effect of santal oil cannot be awaited, then morphine gr. $\frac{1}{4}$ - $\frac{1}{2}$, especially in suppositories, will afford quick relief. When this does not act promptly iodoform, gr. $\frac{1}{2}$, may be added to the suppository. Belladonna has yielded no results to me in doses that are safely administered. At the same time that the suppositories and santal oil

¹ Valentine: "Der Einfluss der Balsamicis, insbesondere des Santalöls auf Gonococcen." Pick's Archiv, April, 1895.



FIG. 10.—Albarrán's Modified Guyon Instillator.

are used, local depletion may be hastened by the application of four to six leeches to the perineum.

It is generally held that when acute gonorrhœa suddenly invades the posterior urethra, direct treatment of the anterior urethra is contraindicated. Comparison of the results of this neglect of treatment with those obtained by continuing local treatment show to the decided advantage of the latter. Therefore irrigations must be continued. If the patient is too weak to have them administered in the sitting posture, he may receive them while lying in bed. To facilitate such irrigations a sewing-board or leaf of an extension table may be pushed under that part of the mattress beneath the patient's buttocks. With ordinary care, irrigations can then be performed without even moistening the bed-clothes.

It is more particularly in the exceedingly severe cases which persist despite all the treatment above described that intravesical irrigations of potassium permanganate give prompt relief. The hot (110° to 120° F.) antiseptic solutions, very gently administered, seem to act as a soothing poultice to the inflamed, eroded posterior urethra. It is not rare to see a patient after such an irrigation fall asleep and rest comfortably for several hours, to awake much relieved.

Guyon uses several drops of a one to two per cent. silver nitrate solution instilled into the posterior urethra. While the relief so obtained cannot be denied, the local reaction that follows is frequently very severe. This may be limited by precedent appreciable doses of morphine, by preliminary instillation of a few drops of cocaine if one is sure that the patient is not too susceptible to its toxic effects, or by giving the patient a quarter of a teaspoonful of sodic bicarbonate (Köbner) thirty minutes before making the instillation.

If, for any reason, irrigations cannot be employed, Guyon's

instillations may be used every two or three days. The severe pains they produce can be very materially reduced, and often entirely avoided, if Guyon's technique be closely followed.

The instrument found best for the purpose is Albarrán's modification of Guyon's instillator. It consists of a syringe, a little larger than the ordinary hypodermic syringe, with a rod passing through the piston, by means of which the packing can be rendered tight or loose at will. A tightly fitting metal funnel serves to connect the syringe with a rubber capillary catheter shaped like a bougie à boule, and soft enough to be easily inserted. Each complete turn of the handle deposits a drop of the solution in the posterior urethra. If the deposits are made by quarter turns, and consequently by quarter drops, with an interval of ten to twenty seconds between each application, the pain will be minimized, larger quantities can be introduced, and a quicker effect obtained (Guyon).

V. TECHNIQUE OF POSTERIOR OR INTRAVESICAL IRRIGATIONS.

Keeping in mind how feeble a bundle of muscular fibres constitute the sphincter vesicæ, it is evident that any appreciable quantity of fluid carried into the posterior urethra through the strong compressor must enter the bladder. Hence irrigation of the posterior urethra distinctly implies irrigation of the bladder at the same time. For convenience, therefore, irrigations of the posterior urethra are called intravesical irrigations.

Preparation of the Patient.—The patient is prepared and sits, stands, or lies down, as may be necessary, under the rules detailed on page 12.

The Irrigation.—1. Perform thoroughly all the steps described under Anterior Irrigation (page 16), using only half the quantities of fluid there mentioned.

2. Hold the penis firmly, while gently sinking the nozzle into the meatus, until it is entirely occluded thereby. At the same time slowly increase the force of the flow, by drawing back the flange of the stopcock.

3. As the urethra is felt distending under the left finger tips,

order the patient to breathe deeply and slowly, and to make efforts at urination.

4. Ordinarily when the third step of this operation is being performed, a sensation of purling of the liquid, as it enters the bladder, will be communicated to the left fingers.

5. After one-half or three-quarters of a minute the inflow will become less accentuated and slower, as the bladder is being filled.



FIG. 11.—Holding Basin and Stopcock and Handing Urinal to Patient.

Then slowly push forward the flange of the stopcock, to diminish the force of the flow, until it is stopped. By close observance of this technique, the bladder can be entirely filled without producing pain or even an urgent desire to urinate.

6. Rest the penis on the margin of the basin, leaving the left hand free.

7. Place the stopcock in the basin; pass the right thumb through its large ring; pass the right fingers to the outside of the basin to hold it firmly with the stopcock.

8. Extend the left hand to the shelf on which the glass urinals are kept (one may also conveniently stand under the patient's chair), take one and hand it to the patient.

9. Order the patient to take his penis with his left hand and to direct it toward the urinal, which he holds in his right.

10. Take the basin and stopcock from the patient's lap.

11. Order the patient to void his bladder into the urinal; some can do this sitting, others must rise for the purpose.

12. While the patient is emptying his bladder, pour the contents of the basin into the sink and wash out the basin with warm water, if the patient is to be immediately irrigated again. If not, wash the basin with boiling water, and place it with the used basins, to be thoroughly cleansed after office hours.

13. Without removing the used nozzle from the stopcock, hold both under running, boiling water for a few moments. Then remove the nozzle and place it in a dish kept for used nozzles and containing mercuric bichloride 1:1,000. After office hours boil the used nozzles in water and caustic soda; rinse them in clean water and place them in a dish containing mercuric bichloride 1:1,000.

All the steps of intravesical irrigation, like those of anterior irrigation, can be effectively, thoroughly, and painlessly performed without soiling any part of the patient's person or body, or of the office.

Amount Required for Filling the Bladder.—The average male bladder can comfortably hold about 350 c.c. (nearly fl ̄ xiss.); variations between 250 and 500 c.c. are, however, within the limits of health.

Repetition of an Intravesical Irrigation.—Ordinarily after one irrigation the glass urinal shows its contents to be as clear as when the fluid was sent into the bladder. When this is not the case, the irrigation may at once be repeated.

Impediments to Irrigation.—In some cases, when for any reason the preparations for irrigation are somewhat prolonged, or when the patient is nervous, there may be a somewhat free outpouring of urine from the kidneys, after the patient has emptied his bladder. A small quantity of urine in this viscus may set up such a spasm of the compressor that when an intravesical irrigation is attempted it cannot be overcome by the pressure of the irrigating fluid. Such a patient should be ordered to again empty his bladder; the irrigation will then be quite easily performed.

When potassic permanganate is used in a case in which some urine is withheld, it will be returned from the bladder either turbid or of a light straw or brownish hue. A second irrigation will then produce as clear a fluid as was used.



FIG. 12.—Office Arrangement. *A*, Author's urethral and intravesical irrigator; upper margin of board attached to wall nine feet from floor; *B*, stand eighteen inches high; *C*, marble wash-stand (constructed by Mr. John H. Graham of New York); *D*, hot-water pedal; *E*, cold-water pedal; *F*, outflow trap; *G*, mortar for rapidly making potassic permanganate solutions from tablets; *H*, glass urinal; *i*, bottle containing potassic permanganate tablets, 2 grains each; *J*, glass graduate 1,500 c.c. to measure urine; *V*, tray holding clean urine

Some patients, in making violent respiratory efforts, coupled with endeavors to urinate during irrigation, will force the compressor into a firm tonic spasm. It is well, in such cases, to ask the patient to desist from his efforts, and, while reducing the hydrostatic pressure, to divert his attention from the matter in hand. This is best accomplished by some witticism; not, however, one of which the patient is the object. The slightest tendency of the patient to laugh is instantly accompanied by a relaxation of the compressor and a consequent inflow of the irrigation fluid into the bladder.

Office Arrangement.—In a large genito-urinary practice much time can be gained and convenience secured by an office arrangement as shown in Fig. 12, page 32. It will be observed that the patient's chair stands on a platform. This is eighteen inches high, which is equivalent to irrigating the patient when the chair is on the floor and the irrigator raised only seven and one-half instead of nine feet from the floor. This reduction of pressure will make no difference to the physician experienced in irrigations. Moreover, the platform will prove very convenient, when many irrigations must be done during the day, as it saves the physician much stooping.

Physicians who are obliged to irrigate only a few patients daily do not need the somewhat expensive office arrangements here shown. They can do fully as effective and satisfactory work without.

Further points concerning irrigations will be discussed under the conditions to which they especially apply.

tubes; *K*, small glass graduate to make solutions of silver nitrate, cupric sulphate, etc.; *K*¹, glass dishes holding sterilized nozzles in bichloride 1:1,000; *L*, glass tray containing used nozzles; *M*, tray to hold used instruments; *N, N, N, N*, solutions of silver nitrate, *O*, minim graduate; *P*, bottle containing powdered boric acid; other bottles on this shelf contain carbolic acid, nitric acid, etc.; *q*, bottle holding three gallons boric acid, four-per-cent. solution; *R*, five-gallon bottle containing mercuric bichloride 1:1,000 (*q* and *R* have rubber tubes pending from them); *S*, Bernstein Company's office table; *T*, irrigating basins; *U*, glass urinal; *W*, pan for irrigation in recumbent posture.

VI. CONSTITUTIONAL AND ACCESSORY TREATMENT.

Any conduct, food, or drink that increases the irritation of the inflamed region or regions in gonorrhœa must, as in inflammations of other parts, necessarily increase the disease, prolong its duration, and thwart the ultimate object of treatment.

There is little difficulty in causing patients to submit to the necessary restrictions when they are made aware of the risks incurred by their infraction (see Chapter VII. "Complications"). The constitutional and accessory treatment entails some restrictions, which will be indicated here.

AMUSEMENTS.—The depressing influence which clap exercises upon most minds may be due to the consciousness of being affected with an unclean disease, to the deprivation of sexual intercourse, and to enforced abstinence from alcohol. This, however, would not account for the depression so frequent in those who do not allow the presence of a clap, unless accompanied by painful symptoms, to interfere with their self-gratifications. The possible effect of gonococci toxins directly upon the nervous system may, when better understood, give the explanation.

If a patient with gonorrhœa were to withdraw from all entertainments during the disease, he would necessarily brood over the cause of his ostracism and its consequences. This would accentuate the mental depression. He should therefore seek diversion, such as society, theatres, etc., offer, but most positively avoid people, scenes, exhibitions, and literature that could evoke lubricious thoughts.

BATHING.—There is no reason, during gonorrhœa, for abstinence from the daily bath; on the contrary, it is necessary for the purpose of maintaining the patient's resistance. But several precautions in bathing are absolutely imperative. Before bathing, the patient should urinate, dress the glans with cotton soaked in mercuric bichloride 1:6,000, or boric acid four per cent., and cover the entire penis with a well-fitting condom, to be worn throughout the bath. This is the only safe manner in which gonorrhœal pus can be prevented from mixing with the bathing water and possibly adhering to the sides of the tub,

with all the danger to the eyes of the patient, and to the eyes, vagina, or rectum of another who may use the bath-tub after him. While no one, even in health, will rely upon the care of servants to cleanse a bath after he used it, the gonorrhœic must be specially cautious in this regard. It would never be an excess of conscientiousness if the patient scrubbed the entire bath-tub personally with brush and strong soap, using boiling water into which he has dissolved two ounces of corrosive sublimate, for a tub capacity of twenty-five gallons. Following this, the hot water should be allowed to run again until the tub is entirely filled, to rinse it after the scrubbing. Even those who live in bachelor apartments and have their individual baths should be instructed to do this for self-protection.

After the bath the condom should be removed at once, and thrown into the water-closet or preferably burned.

BED.—The gonorrhœic patient should sleep on a hard mattress with light coverings, lest the heat of either provoke erections, with their determination of blood to the inflamed region, and possibility of chordee. As erections are not likely to occur while the patient sleeps on his side, it will be well if he ties a towel around his abdomen with a hard knot immediately over the spine. Should he turn on to his back during sleep, the pressure of the knot will either awake him or cause him to return to his side without disturbing his sleep.

BEVERAGES.—With a view to diluting the urine so that it may prove less irritating to the urethra, diuretics and diluents of all kinds are advised. The only diluent of any value is pure water in very large quantities, as a gobletful (fl 5 vi.) every two hours or every hour.

All alcoholic beverages must be strictly interdicted, unless the patient is in the habit of using them to such an extent that his appetite would suffer from the deprivation. Then a glass, or even two, of light claret may be allowed at meals. But beer, white wine, champagne, whiskey, and brandy must be positively forbidden.

CARBONATED DRINKS, such as vichy, seltzer, ginger ale, sarsaparilla, soda water, and other beverages charged with carbonic acid gas, are much used by patients with gonorrhœa, under the prevailing impression that they are beneficent in the disease. This is a signal error, as all these drinks are genito-urinary

irritants. The extent to which the damage caused by carbonated drinks can go is well shown in a case reported to the Deutsche medicinische Gesellschaft by its president, Dr. H. G. Klotz, on March 6th, 1899. The patient, aged twenty-two, had been treated for gonorrhœa and stricture. Suddenly a white lump, resembling macerated chalk ("geschlemmte Kreide") and some blood were ejected from the urethra, amidst violent pains radiating from the renal region. For some days the urine was heavily turbid and contained albumin. Chemically and microscopically phosphates were found, and the sediment contained various cocci and epithelial cells. The author assumes that phosphates had accumulated in and irritated the renal pelvis and calices *in consequence of the patient's drinking large quantities of carbonated soda*. The author shows that an accumulation *per se* so innocent as that of phosphates can produce inflammation of the kidney, if improperly treated or neglected. Such an acute nephritis can as readily proceed to chronic nephritis as can the renal inflammations due to other causes.

Klotz relied mainly upon urotropin in this case, which was cured in the course of three weeks.

This and many cases with a similar history may account for the large number of kidneys invaded and destroyed by gonococci, if they were perfectly healthy before the patient was the victim of clap.

"DRINKING AWAY A CLAP."—Many patients assure their physician that they have known men with very acute gonorrhœa to drink heavily for a long time and thus cause the clap to disappear. Some will relate this as a personal experience in a previous attack. This statement deserves all the allowance physicians must make for the curious ideas that in some manner have forced themselves upon the laity. The fact remains that the patient who alleges that he "drank away" a previous clap, or honestly thinks he knows of others who performed this impossible feat, is then under treatment and continues under it until he is well. Meanwhile he abstains from fantastic efforts to cure the disease with alcohol in any form.

EXERCISE.—Unless the patient has fever, he should take sufficient exercise to keep himself in good condition. Walking,

¹ Klotz: "Phosphaturie und Pyelo-Nephritis." New Yorker medicinische Monatschrift, October, 1899.

driving over smooth roads, rowing, and such outdoor sports as will give him gentle exercise are certainly recommendable, not only for their physical but also for their mental effect.

BICYCLING AND HORSEBACK RIDING must be positively forbidden during gonorrhœa, as they expose the testicles and prostate to vibration at least, or small concussions, if not severe injury, inviting extension of the disease to these organs.

In this connection Prof. G. Frank Lydston says:

"Cycling frequently produces hyperactivity of the sexual organs with resulting disposition to sexual excess and aggravation of any pathological condition which may be present . . . urethral and prostatic inflammation are often aggravated by bicycle riding. Relapses of inflammatory troubles of the urethra, prostate, and bladder very often follow bicycling. I doubt whether inflammation may be produced *de novo* in individuals possessing a previously healthy genito-urinary apparatus. An exception might possibly be made in the case of individuals who ride that peculiar form of bicycle invented by the devil and dedicated to Eros—the bicycle built for two."

FOOD.—If a patient with gonorrhœa has not a disturbing elevation of temperature, he certainly requires sufficient food to keep him as well nourished as possible, to aid him in resisting the microbic invasion. In this quest all articles difficult of digestion must be avoided, as must all food that for any reason disagrees with the patient.

Some authors hold that if a patient with gonorrhœa were kept in bed on a very low diet, he would recover from the infection without local treatment. I regret that I must confess having made the experiment, which each time resulted in abject failure.

While complete rest in bed and low diet are absolutely necessary in the severe form of posterior gonorrhœa, they are useless without proper medication (see Chapter IV., "Acute Posterior Gonorrhœa").

When acute gonorrhœa is not accompanied by much elevation of temperature, and when no complication obliges the patient to remain in bed, this, together with reducing his food,

¹ Lydston: "Athletics in their Relation to the Male Genito-Urinary Organs." Medical Mirror, St. Louis, September, 1899.

would supply means for reducing his resistance to the microbic invasion.

GIN is mentioned separately because of the wide reputation it unjustly enjoys for beneficial effects in gonorrhœa. While it acts as a diuretic, it irritates the kidney directly and the rest of the genito-urinary apparatus as much or even more than any other alcoholic beverage.

SUSPENSORY BANDAGES.—Their necessity in gonorrhœa is discussed under Epididymitis, page 55.

TOBACCO.—It is not shown at all that smoking or chewing tobacco exerts any unfavorable or favorable influence upon gonorrhœa, unless the patient uses tobacco to a depressing extent. Then, naturally, its use must be curtailed.

VII. COMPLICATIONS AND SEQUELÆ OF GONORRHOEA.

An acute gonorrhœa, if treated by properly conducted irrigations from the inception of the disease, does not become complicated. But patients with a first gonorrhœa, or those who have never been treated by irrigations, are not likely to come for treatment early, *i.e.*, when the first swelling of the lips of the meatus presents, or shortly thereafter. Others, in whom irrigations have not been judiciously employed, may present complications. A final and very large class embraces those men who had gonorrhœas before and, having been improperly treated, acquired conditions (strictures *inter alia*) which complicate the newly acquired disease.

When urethral complications existed before the new gonorrhœa, they cannot be diagnosed until the acute symptoms have been subjugated by irrigations, as the insertion of an instrument into an acutely inflamed urethra is never warranted. The only exception hereto may be in acute retention, when all other means have failed, and catheterization remains the sole refuge for emptying the bladder.

For convenient reference, the most frequent complications of gonorrhœa are here placed in alphabetical order.

ABSCCESS, *Follicular and Peri-urethral*.—If the gonococci limited their search for pabulum to the surface of the urethra, their

progress, and that of the inflammation they produce, would extend only backward. But they also invade the mucous follicles and gland ducts. When this occurs, as it very frequently does, the finger passed along the lower surface of the urethra when exposed as for anterior irrigation (*vide ante*, Fig. 8, page 15) finds distinct nodulations. The glands and follicles are especially well developed at the meatus, whence pus may be easily expressed.

When swelling or inflammatory exudation occludes the ducts, the normal or catarrhal secretion of their glands is retained. The resultant pus pockets (follicular abscesses) are thus explained. As the follicles are ordinarily most numerous in the anterior third of the pendulous portion, this is the most frequent site of these abscesses. They soon become distended with pus and then feel like shot of various sizes under the skin, which is normal in color and freely movable over the abscesses. Touching them sometimes causes quite sharp pain. While in this condition, the probability is that they will open into the urethra. When the abscesses terminate in this manner, the ducts that have been occluded become patulous again.

When the follicular abscess does not terminate as just described, the skin over it becomes red and attached to the nodule. If not relieved by early incision it breaks down and the pus cavity is evacuated externally. The duct of the gland so destroyed is obliterated, and the abscess cavity heals by granulation.

Sometimes quite an agglomeration of such follicular abscesses presents near the attachment of the frenum to the meatus. The frenum is then apt to become very œdematous, entirely obliterating the normal depressions at its sides. The angry appearance of the region conveys the impression that the abscess must destroy or at least perforate the frenum or result in fistula. But after discharge of the pus, the abscesses ordinarily heal, the œdema subsides, and the ducts of the follicles remain closed; consequently neither fistula nor destruction of the frenum results. As, however, either outcome is possible, the unaided breaking of these abscesses should not be awaited.

A gummatous nodulation at the base of the frenum, usually painless, may be mistaken for follicular abscess, especially if the patient has forgotten, as sometimes in reality happens, that

he ever had syphilis. If the tumor is gummatous, vigorous antiseptic dressings are decidedly contraindicated. Incision could produce only breaking down of the gumma, insuring perhaps large destruction of the penis. Therefore when such a gumma presents, nothing but mild antiseptic dressings should be employed, while remedial measures are administered constitutionally.

As the mucous follicles at the frenum are walled by rather dense fibrous tissue, their abscess formation is circumscribed. Yet from any cause this fibrous envelope may give way and produce extensive destruction and deformity of the glans. Therefore surgical intervention, as early as possible, is a wise and necessary precaution. Failure to employ it has occasionally been followed by such cicatricial contractions as to so distort the relation of the glans to the penis as to make erection exceedingly painful and coitus impossible.

The follicles at other parts of the urethra than those near the frenum have less connective-tissue protection. Therefore when they become involved their disease products are prone to invade the tissue of the corpora cavernosa penis and still more the corpus cavernosum urethræ. Suppuration of the follicles here takes on the form of peri-urethral abscess.

These abscesses around the urethra originate as folliculitis or adenitis. Their pain, tenderness, and swelling are greater and develop more rapidly. If the swelling urethraward is more marked, the urinary stream is smaller than normal. Sometimes, when the pain is greatest, the duct proves to be the point of least resistance. It will then suddenly give way and permit the pus to escape into the urethra. The pain then is arrested or very much mitigated, the tension about the swelling is reduced, and the urine carries with it pus and blood. If the abscess cavity points forward, *i.e.*, toward the meatus, it will probably heal rapidly. If, however, it has not this direction, urine may enter it and urinary infiltration with all its dangers may result, requiring rapid, free incision. Should the abscess open both within the urethra and through the skin, urinary fistula is the consequence.

When a peri-urethral abscess first presents, gentle massage may cause its contents to overcome the swelling of the duct and restore its patulousness. When this fails, the enlarged glands

or follicles should be slit, curetted, and dressed with nosophen. The large amount of pus that then escapes seems utterly out of proportion to the size of the tumor. When the swelling is diffuse or painful, enveloping the penis in hot or cold antiseptic dressings may give relief.

While it is true that many peri-urethral abscesses open spontaneously, it is not well to rely upon this outcome; it is likely to result in an open sinus or fistula. When such spontaneous opening has occurred, permanent catheterization should be employed as a safeguard against urinary infiltration.

If unhealed follicular or peri-urethral abscess precedes an acute gonorrhœa, the dangers and difficulties of cure are very much enhanced.

ADENITIS (*gonorrhœal*)—see Lymphadenitis.

ADHESIONS (*preputial*) are often practically congenital. At all events many children sent to the specialist for circumcision are found to have the prepuce more or less firmly adherent to the glans. Concretions of smegma may harden and cause ulceration of the delicate mucosa; drops of urine may be retained in the preputial sac, decompose and irritate the tissues, and urinary salts may form calculi there. The constitutional consequences of adherent prepuce and the other conditions mentioned are well described by pediatricists.

When an adult with adherent prepuce acquires gonorrhœa the case is practically incurable, unless the prepuce is immediately detached from the glans. This is easily done with a stout, blunt probe, after injecting a four-per-cent. solution of cocaine into as much of the sac as can be reached by it. While the denudations so produced may threaten invasion of the organism, especially if the gonorrhœa depends upon a mixed infection, the chance of danger is far less than if the disease is allowed to continue because of the adhesions. After separating the prepuce, readherence of the raw surface will be prevented by dressing the glans with absorbent cotton soaked in mercuric bichloride, as described on page 16. When the orifice of the foreskin is too tight for the admission of cotton, reformed adhesions should be broken up by passing the sterilized probe entirely about the glans, beneath the prepuce, before each irrigation. The lesions produced by this little operation ordinarily heal in about forty-eight hours, leaving a freely movable foreskin.

Notwithstanding the favorable result, such patients should be circumcised as soon as they have recovered from gonorrhœa.

When preputial adhesions result from gonorrhœal balanoposthitis, they should be treated as above outlined. As then the inflammatory process has usually much thickened the foreskin, greater gentleness in the operation, if possible, is required. It may be well, in such a case, to keep the penis continually soaked for a day or two in hot bichloride solution 1:10,000 that the swelling may subside before separating the prepuce from the glans. In extreme cases it may be wise to remove the foreskin entirely if the above-mentioned measures cannot be carried out.

Stripping the prepuce beyond the glans to break up adhesions is exceedingly painful, unsurgical, and unnecessarily prolongs the treatment. Moreover, it exposes the patient to the dangers of paraphimosis.

ALBUMINURIA.—The urine of a gonorrhœic always contains albumin as part of the pus it carries. When vesical tenesmus accompanies the disease, the urine shows more albumin than is accountable by the amount of pus present. The explanation of this excess of albumin that seems most reasonable has been mentioned on page 22. The treatment for this mechanical albuminuria is touched upon under vesical tenesmus (page 27).

ANÆMIA.—When anæmia complicates a gonorrhœa, the patient's vital resistance is reduced, the case prolonged, and invasion of other organs invited. Such a condition must be met by the appropriate constitutional remedies, in addition to irrigations.

BALANITIS AND BALANOPOSTHITIS.—“Though gonococci seem to play no causative rôle in the production of balanitis, or inflammation of the surface of the glans penis, this is a frequent complication of gonorrhœa” (White and Martin). On the other hand balanitis, so frequently produced by uncleanness, phimosis, or adhesions of the prepuce, may extend to the urethra evoking a discharge therefrom which symptomatically resembles gonorrhœa. The absence of gonococci from this discharge may prove the urethritis to be due to an infection from the balanitis.

Most frequently, predisposition to inflammation of the mucous lining of the glans and foreskin is brought about by a very large or very dense or tight prepuce, or one with a small opening. The normal secretions are then retained causing

epithelial softening, and the apposed surfaces rub upon each other, producing denudations. When contagious material enters the preputial sac, it finds at least some of the region without its uppermost epithelial protection and therefore a good culture medium.

Rheumatism, gout, and diabetes also predispose the patient to balanoposthitis.

Traumatisms, even so slight as friction from the clothing, violent attempts at intercourse, and contact with irritating discharges may also cause balanoposthitis.

Heat, some tickling or itching about the glans, provoking frequent erections, inaugurate inflammation of the mucous covering of the glans or lining of the foreskin. This is usually associated with or quickly followed by redness and swelling of the preputial orifice. A little later a foul-smelling discharge, if not so copious as to escape unaided, can be pressed out of the orifice. If the prepuce can be stripped back, a thick, paste-like, irregularly lumpy secretion, mixed with liquid pus of a very putrid odor, is discovered. When the inflammation has existed some days, the mucous membrane of the glans may be eroded, occasionally in circular or irregular spots, grossly resembling chancre or chancroid.

If neglected, the inflammation of the preputial sac is likely to cause immense swelling of the foreskin and glans. The œdema of the foreskin may go over into an erysipelatous reddening, which may extend to the root of the penis. The lymph ducts may be involved. Inflammatory phimosis or paraphimosis may result. The pressure then exercised by the prepuce and the glans upon one another may produce gangrene of either or both.

Even if such extreme results do not obtain, balanoposthitis may cause adhesions of the prepuce to the glans, rendering erection painful and coitus impossible.

The first indication for treatment of balanitis and balanoposthitis is naturally in the removal of the cause. When the foreskin can be everted, the sac must be gently but thoroughly cleansed with cotton tampons soaked in hot bichloride solution 1:3,000 or 1:4,000. Then nosophen is thinly strewn upon the exposed mucosa. A thin layer of absorbent cotton is placed about the glans, and the foreskin drawn into place again. According to the severity of the case this may be repeated twice

or three times daily. Light cases, that seemed inveterate under other treatment, yield to the one just described very quickly, sometimes as soon as within forty-eight hours.

When the disease has proceeded to such swelling of the prepuce that it cannot be retracted or when it affects the sac of a tight or partially adherent prepuce, irrigations of the sac with potassic permanganate 1:2,000 or 1:3,000, twice or three times daily, will cause the inflammation to abate.

When the prepuce is œdematous and very tender to the touch, the penis may be kept continuously wrapped in a hot bichloride

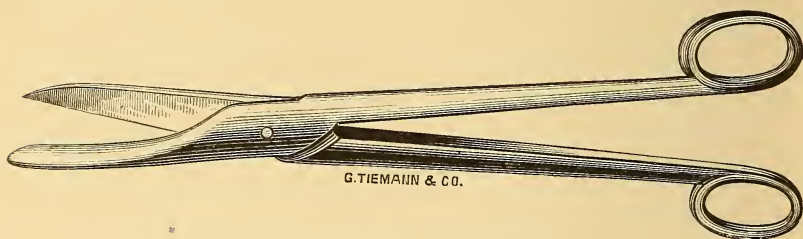


FIG. 13.—Taylor's Phimosis Scissors.

solution 1:10,000 until the swelling subsides sufficiently for more direct treatment.

When the inguinal glands are enlarged in the presence of a very intense swelling of the foreskin, through which an induration is felt, the surgeon may be justified in splitting the prepuce to expose and treat a possible phagedenic ulcer, which, if neglected, may destroy the glans or a great part of the penis.

Under such circumstances, or when the patient is a diabetic, it is usual to slit the dorsal aspect of the prepuce, with a view to complete circumcision, after the acute inflammatory condition has passed off. But this slitting, especially when the swelling and induration are great, does not expose the glans and the lining of the prepuce nearly as much as would be desirable. Therefore it is much better and more effective to cut both sides of the foreskin midway between the dorsum and the frenum, as proposed by Taylor. The scissors he devised for the purpose will be found the best instrument that can be used. When these scissors are not at hand they can be substituted by a grooved director to protect the glans and guide a stout curved bistoury to the coronary sulcus.

The danger of infecting the so cut surfaces must be accepted as the risk preferable to the one of allowing the penis to be destroyed by an unknown ulcer.

Immediate circumcision would be more desirable, but the incision that then encircles the penis would not be likely to unite by primary union. Even if general infection does not result, circumcision in such cases is prone to be followed by extensive sloughing, from whose destructive results the thermocautery even may not save the penis.

Later on, when the primary condition has subsided, complete circumcision may be advantageously performed for cosmetic effect.

BLADDER, Inflammation of—see Cystitis.

BLEEDING—see Hemorrhage.

“BLIND” FISTULÆ, *i.e.*, minute canals having their opening posteriorly from the meatus, may cause a gonorrhœa to be exceedingly obstinate. If the inflammatory condition does not produce their obliteration, or if irrigations do not produce in them that general œdema which would make them an unfavorable culture medium for gonococci, they continue to supply infection to the urethra. They may, in part, account for the five per cent. of failures in the irrigation treatment as collated by Goldberg (page 1).

In obstinate cases they should be sought by means of the urethroscope and silver nitrate injected into them by Kollmann's syringe; this failing they must be slit into the urethra or extirpated. When such a fistula is very shallow and close to the meatus, it can usually be destroyed by electrolysis, performed under cocaine anæsthesia.

BUBO—see Lymphadenitis.

CAVERNITIS may complicate a very mild gonorrhœa, when the urethral epithelial layer is subject to traumatism, admitting gonococci to the mucosa itself, to the submucous tissues, and through these to the corpora cavernosa penis or corpus cavernosum urethræ. The traumatisms doing this damage may be strong injections destroying the epithelium, misuse of a sharp-pointed syringe, clumsiness in use of sharp irrigation nozzles, antrophores, sounds, or catheters. Violence in irrigations, performed by people who mistook their vocation when they entered the profession of Medicine, may cause rupture of the

superficial layers of the urethral mucosa, with a consequent cavernitis.

In the beginning of cavernitis the slight swelling may escape notice except during erection. Then, as the infiltration does not expand with the rest of the organ, it is bent or twisted toward the affected side. If the corpus cavernosum urethræ is affected, the penis is bent in the bow-form, familiarly called *chordee* (*q. v. infra*).

If the invasion of the corpora cavernosa does not end in resolution, permanent infiltration or abscess forms. In the former case local circulation may be seriously impeded, with possibly consequent atrophy of the surrounding tissues. This may so deflect the penis during erection as to render coitus impossible.

In the beginning of cavernitis rest, persistent hot or cold antiseptic applications, leeches to the perineum, low diet, purgatives, camphor or its monobromate, with or without opium, will give relief and aid resorption. In hyperacute cases, in which relief is not obtained by the above-mentioned measures, the infiltration may be punctured with fine needles to allow some blood to escape. The most exquisitely employed aseptic precautions must be observed in this operation, which, as has been suggested above, is in place only as a last resort. In five cases so treated immediate relief was obtained. One retained a slight contraction of the right corpus cavernosum, not enough, however, to interfere with coitus. The others recovered entirely.

In chronic cases galvanism, several times a week, one pole applied to the infiltration and the other to the opposite portion of the penis, may stimulate resorption.

Sometimes general infiltration affects the three corpora cavernosa equally, producing persistent but painless priapism. One patient treated for subsequent stricture said that for three weeks he had been so affected; all remedial efforts proved unavailing. He was sent on a sea voyage, and on the first day the erection subsided. As the physician who had treated this case had died, the exact facts could not be obtained.

Oberlaender¹ cites a case of cavernitis reported by Kollmann which differs very much from those generally described. Im-

¹ Oberlaender: "Die chronischen Erkrankungen der männlichen Harnröhre." Klinisches Handbuch der Harn- und Sexual-Organen, Leipzig, 1894.

mediately after the excision of a primary chancre on the prepuce, preceded by an injection of cocaine, a small infiltration behind the glans appeared. It grew to the size of a bean, and as it became larger, it travelled several centimetres toward the scrotum in the course of a few months. Then it proceeded forward again, dividing into two parts. When so situated erections were disturbed; once the penis was doubled into a decided right angle. Later on the infiltrate travelled to the peno-scrotal juncture, where it remained and became smaller, but could be distinctly palpated four and one-half years after its first appearance. Gonorrhœa could never be proven in this case; nor could this cavernitis be attributable to syphilis, as it was not affected by antisyphilitic treatment. The excision of the chancre did not prevent general infection.

CHANCROID, or CHANCRE, or a mixed sore, may complicate gonorrhœa. But even if either involves the meatus or the urethra, careful irrigations need not be omitted.

CHORDEE, *Chorda Venerea*.—Da Costa,¹ in his admirable chapter on "Diseases of the Genito-urinary Organs," defines chordee as "a condition of painful erection in which the penis is markedly bent." The patients describe it as the sensation of a hot wire drawn through the penis, like the cord of a bow. This bending is naturally in the direction of that part of the penis which is rendered less elastic and therefore cannot take part in the general turgescence of erection. When the inflammatory action penetrates the submucous tissues and from them into the trabeculæ of the corpus spongiosum, its extensibility is naturally impaired. Reflex irritability provokes frequent erections, and as the inflamed corpus spongiosum cannot swell and stretch with the rest of the organ, the penis is bent. In the bending intense pain is produced. The lymph exudation that follows this inflammatory condition fills the intratrabecular spaces, preventing their filling with blood during erection.

The pain may become so intense that the patient in his desperation may recall having heard of "breaking the chordee." This is accomplished by laying the penis on a flat surface, such as that of a table, and striking the curved organ with the fist or a book. One patient reported that he placed his penis on a win-

¹ Da Costa: A Manual of Modern Surgery, Saunders, Philadelphia, 1898.

dow ledge and violently pulled down the sash upon it. White and Martin (*op. cit.*, p. 96) say that "at times patients have sought relief by intercourse. The results are nearly as disastrous as those consequent on forcible breaking, at least one death being attributable thereto."

Naturally, no physician would advocate the brutal violence above mentioned. It may cause laceration of the urethra, with possibly fatal hæmorrhage, rupture, with extravasation of urine and death from urinary infection, laceration of the corpora cavernosa, and gangrene of the penis. Even if none of these supervene and if no very heavy stricture result, the part of the penis anterior to the site of the infiltration may be cut off from enough blood supply to produce erection therein.

In chordee, the treatment outlined under cavernitis may suffice. In very severe cases, persistently continued very hot sitz baths may be added. If these fail, it may be necessary to use opium or any of its derivatives to its full effect.

CONDYLOMATA.—The fact that condylomata usually appear upon the genitals probably accounts for their being called venereal warts. No proof, however, exists that they are due to venereal infection. As they originate most frequently upon moist surfaces, such as the mucous membranes of parts of the male and female genitalia, the Germans call them *Feuchtwarzen* (moist warts). Through careless mispronunciation this easily becomes "*Feigwarzen*," whose translation "fig warts" has in some manner invaded the English language. It would require more than ordinary imagination to conceive any resemblance to fresh or dried figs in these warts, except perhaps when the latter have grown very large and their upper surface exposed to the air presents a dry, horny yellowish-brown color, with rough nodular surfaces.

Weichselbaum described a condylomatous excrescence as a "simple or branched papilla, built on the type of a skin or mucous papilla, and covered with epithelium of varying thickness. The connective tissue in these papillæ is generally much richer in cells and vessels than is the connective tissue of the base from which they spring. The epithelial covering can be materially thicker than that of the region from which it originates, but ordinarily it has the usual character of the epithelium of the region. The papillomata proceed from the normal

papillæ of the skin or mucosa, which enlarge; new formation of papillæ also takes place."

These moist or dry papillary overgrowths may be as small as pin points, or may reach almost any size. They may be discrete or confluent. They begin in the sulci at either side of the frenum and in the sulcus behind the corona with equal frequency. They less frequently originate on the posterior border of the glans, the orifice of the foreskin, and least frequently upon the lips of the meatus. They rarely appear within the urethra.

Irritating discharges either of gonorrhœa or the disturbance set up by uncleanness, secretion retained and decomposed by a redundant or tight foreskin may cause these warts. According to their growth, which often is very rapid, and according to whether or not they are compressed between foreskin and glans, they may assume a shape and color varying from those of a moist red raspberry to those of a yellowish-white cauliflower. They may also by pressure of the foreskin form long ridges "like a cock's comb" (White and Martin).

When flat and macerated by free secretion or discharge, condylomata may be mistaken for mucous patches. When broadened by growth, they may suggest syphilitic warts. But when lues exists, the excrescences on the penis are not usually its only evidence, even if a history of syphilis is denied.

A wart appearing on the penis after middle life should always suggest the possibility of epithelioma, even if its surrounding tissues are not infiltrated and the inguinal glands not indurated. The presumed wart should at once be thoroughly extirpated and microscopically examined for purposes of prognosis.

When condylomata proliferate upon the glans they may induce pressure gangrene of the foreskin. After the gangrenous part of the prepuce is cast off, the whole or part of the condylomata may prolapse through the space so produced. When warts grow upon the meatus they may interfere with urination and ejaculation.

As uncleanness and maceration of their seat are the cause of condylomata, so scrupulous cleanliness and dryness are the prime indications for treatment while they are still small, *i.e.*, when they are but little more than hyaline spots.

When they are isolated and take on the acuminate form, cleansing, drying, and dusting with powdered savin acts as a direct specific.¹ But even when they are quite large, powdered savin is worth trying for a few days. It occasionally causes the warts to slough off with surprising rapidity, leaving a base that heals very soon.

If the mass is large and heavy, it may be touched three times daily with ferric chloride. The surfaces so treated shrink. The shrivelled portions may be curetted and the application repeated. By successive scrapings and applications of ferric chloride the base is eventually reached. This must be thoroughly curetted and its bleeding arrested with cotton pledgets soaked in five-per-cent. solution of antipyrin.

Exceedingly large and confluent warts may require removal by the knife. The base may then be curetted and cauterized, or after curetting, the wound edges brought together by sutures. Usually the bleeding is very copious. If it cannot be otherwise controlled it must be arrested by the actual cautery.

Intra-urethral papillomata, when they do not materially reduce the urethral calibre, can be removed through the urethroscopic tube. When their number and size prevent introduction of the tube, the first growth may be grasped through a meatoscope by means of a silk thread. This serves to draw the urethral mucosa gently forward sufficiently to expose the deeper growths, which then can be removed by ligature or the incandescent snare.

COWPERITIS is of relatively infrequent occurrence. It may be due to aggravating an acute or chronic gonorrhœa by sexual intercourse, undue exercise, an untoward motion, or alcohol, by unskilled catheterization (*i.e.*, traumatism from within), a fall, laceration or cut into the perineum (traumatism from without), "or as a consequence of retrostrictural dilatation, when all ducts are stretched and the mucosa is eroded and inflamed by stagnated and alkaline urine" (Horowitz²).

Cowper's glands being situated between the two layers of the triangular ligament, and also being contained by the deep peri-

¹ Posner: Therapie der Harnkrankheiten, Berlin, 1895.

² Horowitz: "Die Krankheiten der Cowperschen Drüsen." Zuelzer and Oberlaender's Klinisches Handbuch der Harn- und Sexual-Organen, vol. iii., Leipzig, 1894.

neal fascia, their inflammatory swelling is necessarily limited. Their pressure upon these unyielding tissues not only produces intense pain, but also renders the disease externally unrecognizable until these envelopes have yielded. Moreover, as the ducts of Cowper's glands empty into the bulbous urethra, their involvement by gonorrhœa is easily comprehensible. Owing to the fact that the majority of cases of Cowperitis undergo restitution, it may be that they are oftener infected than is supposed and that the complication passes off unobserved.

In the second or third week of neglected or improperly treated gonorrhœa, when the affection has invaded the posterior urethra, Cowperitis is most likely to become manifest. Then slight fever may set in, with a sensation of perineal discomfort. The mechanical impediment produces difficulty of urination and some pain on defecation. Shortly thereafter lancinating pains penetrate the region; these are aggravated by pressure upon the perineum, by sitting and walking. Even when lying down there is a sensation of perineal tension. The pains on evacuating the rectum and bladder increase, especially at the conclusion of urination, due to contraction about the inflamed gland by the transverse fibres of the compressor, as it forces out the last part of the urine.

When but one gland is involved, as is ordinarily the case, it is evidenced by small, hard, exceedingly sensitive swelling at the corresponding side of the raphé about midway between the scrotum and the anus. This tumor may grow to the size of a chestnut, or become as large as a pigeon's egg, over which the skin is movable, while it retains its normal appearance. Palpation of this tumor will not aid materially in diagnosis, as its painfulness prevents deep pressure. Digital pressure under anæsthesia would be unwise, as it might cause a rupture of the distended gland into the surrounding tissues with consequent danger of purulent, and possible subsequent urinary infiltration. The finger inserted into the rectum, its tip gently pressed forward between the external and internal sphincters, will reveal a round, smooth, hot, painful tumor below the prostate. When the tumor is found on one side of the mesian line, no doubt can obtain regarding the diagnosis. When bilateral Cowperitis exists, and if there be much infiltration and distention of the surrounding tissues, the diagnosis is more difficult.

The following will aid in the differentiation:

When Cowperitis sets in, the urethral discharge is ordinarily much decreased or arrested entirely.

Simple perineal abscess causes no compression inward or upward, and consequently does not interfere with urination. Only when it is very large will it produce pain on defecation.

Peri-urethral abscess of the bulb is invariably found centrally located about the raphé, and is situated nearer the scrotum than is Cowperitis.

Resolution ordinarily takes place within fourteen days under proper treatment. This consists in mild, gently administered washings of the anterior urethra, rest in bed, long-continued, very hot baths twice a day, saline laxatives to keep the stools soft, and a hot-water bag to the perineum. If the pain is very severe, morphine hypodermically may be required. When employed, the needle should be as carefully sterilized as for use elsewhere, and care should be taken not to inject the solution into the tumor itself, lest suppuration be precipitated thereby.

When, however, the inflammation is allowed to increase and the gland and periglandular tissues undergo suppuration, Cowperitis assumes its grave form. One or more chills, fever, throbbing in the perineum show that pus has formed, even if fluctuation is not perceptible. If the case is then neglected the abscess may break into the perineum, the urethra, or the rectum. If it breaks toward the perineum it may dissect the skin from its underlying tissues, leaving it hanging like torn rags after perforation. Partial gangrene of the scrotum may also result. Such a spontaneous rupture may produce urethral and rectal fistulæ, whose treatment is often very difficult.

When such dangers are announced free incision should be immediately made. In making this incision it will be well to support the suppurating gland by the index finger in the rectum. After incision the cavity should be curetted or irrigated or both, and packed with iodoform gauze. It will be well to guard against urinary fistula, by keeping the urethra protected by means of permanent catheterization, until the abscess has sufficiently healed.

Chronic Cowperitis shows itself as a hard, not very painful nodule at one side of the raphé, which when pressed upon discharges a turbid, milk-like secretion from the urethra. If it

results after rupture of the abscess, this discharge issues from the perineum or into the rectum.

It is always well to keep in mind that Cowper's glands may be the seat of a tuberculous infection and that therefore the discharge therefrom should be examined for the characteristic bacilli.

CYSTITIS.—Inflammation of the bladder pre-existing, complicating or following gonorrhœa is too vast a subject to be more than merely outlined in a small sketch. That persons with cystitis acquiring gonorrhœa can suffer its extension to the bladder is often proven. That gonococci can find a culture medium in a healthy bladder mucosa is denied. This negation seems to be borne out by the thousands of intravesical irrigations performed daily in acute anterior gonorrhœa. Despite all careful washings of the anterior urethra, the irrigation fluid must certainly carry gonococci into the healthy bladder. Yet no cystitis ever results. It may be held that the gonococci so carried are brought into the bladder by an antiseptic solution. While this is true, no solution strong enough to destroy gonococci could be injected into the bladder without injuring its mucosa. On the other hand, cystitis has often been produced by inserting an instrument through a urethra infected with gonorrhœa into the bladder. The bladder wall may have been bruised sufficiently thereby to injure its protecting epithelium.

Whether gonorrhœa can invade the bladder by mere continuity of surface is still one of the disputable questions. That gonococci can be carried beyond the strong compressor urethræ is proven many times; that they can traverse the weak sphincter of the bladder is indubitable. But whether the healthy bladder epithelium ever can offer them food is not at all established, and from all experience is more than doubtful.

When, however, the urethritis is of a mixed character, *i.e.*, when the gonococcus is associated with other microbes, such as the bacterium coli commune, the bladder epithelium yielding to the latter may open the way for gonorrhœal infection.

Usually the region of the sphincter and of the trigone is the seat of such extension of inflammation, and has been aptly named urethrocystitis by Finger. The great rarity with which this inflammation extends to the rest of the bladder confirms the view of immunity of its lining epithelium to invasion by the

gonococcus. Such invasion must be due to lesions produced by other bacteria.

The symptoms of gonorrhoeal cystitis closely resemble those of posterior urethritis. The urgency and frequency of urination are about the same. The patient also strains during and after ejecting small quantities of urine; he experiences the sensation as if the bladder still contained urine. In this urethrocystitis, however, the patient is somewhat relieved while lying down, until the urine has filled the most dependent, not inflamed, part of the bladder. This limit passed, the moment the urine touches the diseased region it re-establishes the urgency and the pain, which burns and scalds along the entire urethra. In this it differs from acute posterior urethritis, which is not relieved by any position, because the weak sphincter vesicæ yields to slight urinary pressure and lets the fluid escape into the inflamed posterior urethra, where it sets up urgency, straining, and pain after each micturition. The ejection of some drops of pure blood after each urination, with the other symptoms just cited, is pathognomonic of posterior urethritis.

The examination of the urine in portions, for differential diagnosis, is difficult in localized gonorrhoeal cystitis (urethrocystitis) when frequent urination prevents sufficient accumulation within the bladder. In such case the bladder may be washed with a warm boric-acid solution until its outflow is clear, when a carefully sterilized soft catheter is inserted and fastened in place for an hour or two, if it can be tolerated so long. The catheter is clamped, or plugged with a "fausset" (spigot). If the urine that comes through it at the end of this time carries pus with it, the pus probably is from the bladder. The differentiation, however, is open to criticism. Even if pain from presence of the catheter be not so great as to prevent its use, there may be sufficient "back-flow" of pus from the posterior urethra to give the impression of cystitis, by the pus the accumulated urine carries. The only reliable method of differentiation is by means of the microscope. If the urine extruded shows a preponderance of bladder epithelium, and especially that of its middle or lower layers, the existence of cystitis is established beyond peradventure.

Pus in the urine is easily recognized by adding to it saturated solution of caustic potash, and twirling the tube containing

the mixture in as good an imitation of the centrifuge's action as can be done by the hand. The urine becomes clear, and the separated pus assumes a ropy, mucoid form. Donn , who devised this test, forcibly, albeit inelegantly, describes it as "rotzig" (snotty). Repugnant as is the adjective, none seems more apt for precise description. In cold weather this reaction may not be very prompt; slightly warming the tube will then hasten it. If this does not then result, the turbidity is due to phosphaturia, albuminuria, bacteruria, or an excess of epithelia.

Another specimen of the same urine may be heated. If it grows more turbid over the flame, it shows that it contains either earthy phosphates or albumin. The addition of acetic acid will clear the urine if phosphates have rendered it turbid. If acetic acid does not change or even somewhat intensifies the turbidity, it proves the presence of albumin. The latter, however, is always present with pus.

When neither heating nor acidulation affects the urine, bacteruria will usually be proven by the microscope.

The treatment of gonorrh al cystitis, which almost invariably presents itself as urethrocystitis, is practically the same as that advised for acute posterior urethritis and acute prostatitis.

DIVERTICLE, urethral—see Urethral Diverticulum.

EPIDIDYMITIS, or ORCHI-EPIDIDYMITIS, or both, like most of the other complications of gonorrh a, may result from a precedent condition or from a new gonorrh a. If preceding a new gonorrh a, inflammation of the epididymis or testicle or both may be due to traumatism, non-gonorrh al infection, tuberculosis, or syphilis.

As both the epididymis and testicle are frequently affected together, it is often impossible to decide whether one or the other is free from inflammation, and as the treatment of both ailments does not differ, there is ample warrant for considering them conjointly.

The frequent difficulty, and often impossibility, of positively establishing that the testicle is not affected in gonorrh al epididymitis may have led to the assumption that it limits itself to the epididymis. Further development of radiography of the soft tissues will probably soon lead to finer differentiation with consequent improvement in therapeutics. Carl Beck, of New York, made distinct pictures in which even the walls of the

arteries were plainly radiographed in the living; there is every reason, therefore, to hope for the outcome above expressed, with all its advantages to diagnosis and treatment.

The pathological changes evidenced by post-mortem examinations and the experimental examinations made by Malassez and Terrillon (quoted by Finger¹) primarily show the testicle not to be involved. As, however, post-mortem changes may not have left evident serous infiltration or sanguinary engorgement, these observations cannot be taken as finally decisive.

These authors found the epididymis enlarged, hyperæmic, occasionally with circumscribed foci of pus; in old cases the epididymis was tough and calloused. The tunica vaginalis testis showed acute, serous, or serofibrinous vaginalitis. The vas deferens was often thickened. The microscope showed a catarrh of the seminal ducts and parvicellular infiltration of its connective-tissue envelope. The epithelium of the seminal ducts was turbid and swollen, deprived of its cilia; in still older cases it was entirely absent, and the lumen of the canals filled only with spermatozoa, with parvicellular infiltration, or fibrous, calloused by connective-tissue change of the infiltrate, in advanced cases. The changes in the vas deferens also begin with catarrh of the mucosa, to which parietal infiltration and thickening of the walls are added later on.

It is held that epididymitis sets in most frequently during the third week after infection. Finger (*op. cit.*) collected the data of several authors, showing that in 1,015 gonorrhœas, epididymitis appeared in the first week after infection in 46 cases; second week in 157; third week in 132; fourth week in 191; fifth week in 132; sixth week in 64; seventh week in 44; eighth week in 61; from three to six months after in 117; from six to twelve months in 52; two years in 9; three years in 7; four years in 2; and seven years after in 1.

The very long intervals between gonorrhœal infection and epididymitis in some cases being evident from the above, its possibility must not be forgotten when a patient has epididymitis with a long passed history of clap. Then often unnecessary castration for presumed tuberculosis will be avoided. Senn² in

¹ Finger: "Die Hoden und Nebenhoden." Klinisches Handbuch der Harn- und Sexualorgane, vol. iii., 1894.

² Senn: Tuberculosis of the Genito-Urinary Organs, Saunders, 1897.

one of his admirable works says: "Except in cases of acute diffuse miliary tuberculosis, the essential organ of generation in man is seldom the seat of primary tuberculosis." On the other hand, gonorrhœal epididymitis and traumatism are often the exciting causes of tuberculous disease of the testicle and epididymis. Senn' cites an illustrative case reported by Birch-Hirschfeld (*Archiv für Heilkunde*, 1871, Heft 6):

"A soldier, 24 years of age and in perfect health, contracted gonorrhœa which led to acute epididymitis. In the course of eight days he died of miliary tuberculosis. Miliary tuberculosis was found in the peritoneum, especially well marked at the internal inguinal ring on the side of the affected testicle; miliary tuberculosis of the pleuræ, lungs, meninges, liver, spleen, and kidneys also existed; the epididymis was transformed into a cheesy mass. In the testicle itself numerous intercanalicular miliary tubercles were found, with a few cheesy nodules the size of a pea."

In all cases of gonorrhœa the patient should wear a well-fitting suspensory bandage. I am not aware that any statistics exist showing the value of this bandage as a precautionary measure. It seems, however, reasonable to assume that the scrotal contents, so supported, must be less exposed to traumatism than they would be if left to dangle by the often relaxed general condition of depressed vital tone.

The selection of a suspensory bandage is not an unimportant matter. The form ordinarily dispensed, having no "back straps" to draw the bag perineumward, cuts the posterior aspect of the scrotum and pulls it into an abnormal position. The bag itself is of thick material in which the scrotal sweat cakes and hardens, irritating the skin, unless the bag is frequently washed. To avoid these defects, the suspensories should be of the forms sold as the "Syracuse" or "Army and Navy," or "Schnotter" suspensories. These have straps passing from the centre of the posterior boundary of the bag, between the thighs, over the nates, to be fastened to the belt. Recently the bags have been made of a strong but very light linen mesh, which not only firmly holds the scrotum in place, but is also cool and comfortable.

Gonorrhœal epididymitis, orchitis, or orcho-epididymitis is

¹ *Op. cit.*, p. 54.

usually ushered in by vague aching, sharp stitching, or continued neuralgic pains along the groin. Sometimes the pain is distinctly defined as proceeding the length of the spermatic cord and dipping into the lower abdomen. The pain may be aggravated by standing or walking, and not relieved by sitting. Examination of the cord shows the vas slightly enlarged and tender.

Occasionally none of the pain or tenderness described above warns the patient or the physician of the approaching complication. This fact emphasizes the need of daily examination. When thickening and slight tenderness of the vas on pressure between the fingers are found, active steps should be at once taken to abort the inflammation.

In some cases, when the patient is not observant or when the physician is compelled to omit daily examinations, the complication appears to come on suddenly. A dragging pain is fixed in the testicle; the epididymis swells rapidly; the scrotum over it takes on œdema and soon becomes purplish. The pain nauseates the patient; it may even lead to vomiting, as after a kick or blow upon the testicle. The urethral discharge usually is diminished or disappears during the acuity of inflammation of the scrotal contents.

The epididymis is sensitive to touch, but this sensitiveness varies. In some cases it bears no relation at all to the increased size of the epididymis. A very slight enlargement of this gland may be exquisitely tender to the touch, while when it is so enlarged as almost to entirely envelop the testicle and exceed it materially in size, it may be rather roughly handled without producing pain.

Not infrequently the tunica vaginalis becomes involved, with consequent serous effusion. The acute hydrocele so resulting may envelop the whole testicle in a large, tense swelling, misleading the inexperienced to a diagnosis of orchitis. The translucency of the fluid and the enlarged epididymis behind the swelling will prevent this error.

If the patient can walk, he spreads his bent legs wide apart, carries his body forward as if in continual desire to rest his hands upon his knees. When about to sit down, he grasps the chair and lets his body down slowly. Rising from the chair is accompanied by the same painful effort, as is any attempt to cross his knees.

In the erect posture, the pain is increased. The weight of the swelling drags upon the spermatic veins, reducing their lumen; the blood from the testicle cannot therefore return upward. The so augmented tension and pressure may cause the pain to be reflected to the perineum, rectum, back, bladder, down the thighs, abdomen, and the chest. When the reflex pains are as extensive as described, chills, fever, anxiety, and mental depression may become so marked as to overshadow the condition that provokes them. The abdomen may swell and become very sensitive; nausea, vomiting, and collapse may convey the idea that the patient has peritonitis. These reflex symptoms usually subside rapidly, and the swollen epididymis remains in evidence of their cause.

In undescended testicle, to which inflammation is communicated, the patient may have all the symptoms of strangulated hernia. Emptiness of the scrotum, however, will prevent this mistake.

With prompt and proper treatment, inflammation of the scrotal contents generally ends in resolution. The acute symptoms usually subside in a week or ten days.

When through neglect suppuration occurs, there are increased pain, chills, fever, sweating, and abscess is made evident by fluctuation. On opening it, the entire epididymis may prolapse out of the wound, especially if the operation has been unduly delayed. The delay may also lead to destruction of the entire scrotal contents.

The acute hydrocele resulting from acute epididymitis often becomes chronic.

The most frequent result of epididymitis is the formation of a hard, painless nodule at its head or its tail. This nodule in no wise locally disturbs the patient; in some cases it rivets his attention and becomes the object of his continual thoughts, evoking most persistent neurasthenia.

Treatment.—In a small number of cases the vas deferens shows the first sign of its carrying infection to the epididymis and possibly, through it, to the testicle. The funiculitis then evidences itself by pain and swelling in the inguinal region. Copious leeching of the region will then relieve the pain and in many cases prevent active involvement of the scrotal contents.

If the epididymis is found swollen at the same time, and

there be enough pain to warrant it, the patient should be kept in bed. A board or a sheet of tin, about the size of a cigar-box lid, should be cut so that it will lie comfortably upon the thighs and support the testicles. A three-inch gauze bandage is then wrapped smoothly entirely about this support to insure its softness. Over this a sheet of impermeable tissue is folded to fit neatly.



FIG. 14.—Support for Testicles.

Four or six layers of gauze eight by ten inches are then soaked in an antiseptic solution of five per cent. carbolic acid, 1:6,000 bichloride or, if preferred lead and, opium lotion, and wrapped gently around the testicles. The solution may be applied hot or cold as may prove most grateful to the patient, and should be renewed every fifteen or twenty minutes.

If the pain is not relieved in forty-eight hours, the case should be treated as described further on.

When the funis is not at all or but slightly swollen, strapping the testicle will, in the majority of cases, afford instant, complete relief from pain and will cut short the disease. This treatment should, however, not be attempted unless the physician is thoroughly familiar with its technique and has the firmness to give the patient that short increase of pain which strapping inevitably entails.

The technique of strapping a testicle as I employ it is a modification of Fricke's method:

The patient lies on a table, his legs extended flat upon it and somewhat abducted; he or an assistant slightly supports the scrotum while the dressings are being prepared. Two strips are cut from a three or four inch gauze bandage, according to

the size of the swelling, and long enough to cover the scrotum from the perineum to the pubis. These strips are smeared with an ointment, slightly modified from that proposed by Casper, of Berlin, and composed of ichthyol 2.5, guaiacol 5.0, ung. hydrarg. 10, vaselin and lanolin, p. æ. ad 30.0. The use of these strips renders shaving the scrotum unnecessary.

The neck of the scrotum of the diseased side is then grasped between the left thumb and middle or index finger, and with increasing pressure the testicle is forced to the bottom of the scrotum. The compressing fingers are steadily, forcibly contracted until the region about the funis is reduced to its smallest possible calibre. Without releasing the grasp of the fingers a half-inch strip of strong adhesive plaster is firmly wrapped immediately below the fingers so tightly as to convey the impression that the funis might be strangulated thereby. This is the most painful part of the whole procedure. If not thoroughly done, the entire purpose of the strapping will be thwarted: the patient will experience no relief, the case will be aggravated, the scrotum injured and its contents exposed to abscess formation. Cases are not rare in which physicians, guided more by sympathy for their patients than by steadfastness of purpose, have strapped the swelling so that the testicle was forced up toward or almost into the inguinal ring and the epididymis away from the testicle.

After the first strip of adhesive plaster (which I think may be properly called the "choker") is firmly applied, the superficial veins of the scrotum will for a moment enlarge and stand as blue, more or less tortuous strings beneath the skin. One of the gauze strips smeared with the Casper ointment is firmly and smoothly laid from the posterior neck of the swelling to its anterior aspect, and the second strip is similarly applied at right

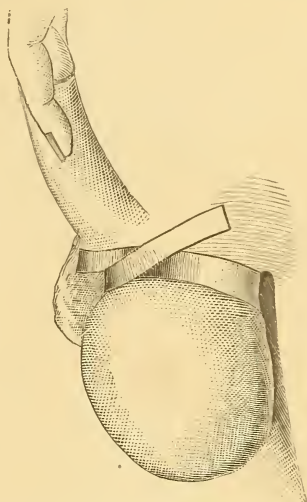


FIG. 15.—The First Strip of Adhesive Plaster.

angles to the first. A second "choker" about three to four inches wide is now firmly wrapped around the root of the tumor covering the first "choker" and holding the four ends of the gauze strips in place. Then an adhesive strip half an inch wide and of sufficient length, is firmly attached to the centre of the posterior (perineal) aspect of the choker, tightly drawn over the testicle and attached to the centre of the anterior part of the choker. A second strip is similarly placed from the choker at the external surface of the scrotum to the mesian surface, at

right angles to the first strip.

A third strip is attached to the choker, immediately adjoining and slightly overlapping the second strip's entire course. Successive strips are placed in the same manner until the entire testicle is firmly encased.

It will be found necessary to heat thoroughly each strip and to apply it as hot as it can be borne by the patient, to secure its adhesion to the grease that oozes through the gauze. It will also be convenient to apply a new choker after each three or four longitudinal strips are applied.

All attention should be directed to applying the strips smoothly, and with as firm and even pressure as possible.

After the last longitudinal strip is applied, the whole dressing should be reinforced by a final choker about six inches long. Two or three turns of the choker are made about the neck of the tumor, the remaining strip is made to envelop the other longitudinal strips by interrupted spiral turns, returning to the neck.

The projecting ends of the adhesive plaster about the neck of the scrotum are then cut off closely above the choker; the projecting ends of the gauze are also trimmed but allowed to extend about one-eighth of an inch above the choker, to protect the skin from erosions that otherwise would be likely to result.

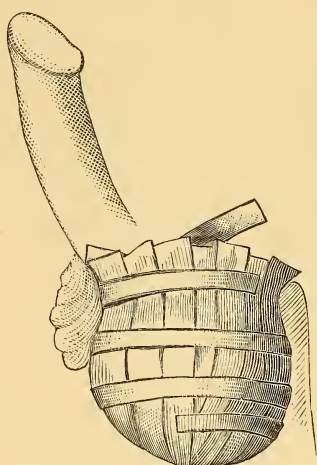


FIG. 16.—Testicle Strapped.

Before the patient rises, a large suspensory bandage with back-straps is firmly applied, after enveloping the whole testicle in a layer of cotton. Absorbent cotton having lost its resiliency in being prepared, should not be used for this purpose.

The whole procedure, from placing the patient on the table to buckling the suspensory bandage, should not occupy over five minutes; the increased pain caused by applying the first choker should not, with ordinary skill, extend over ten seconds, the other manipulations should be comparatively painless.

After the testicle is drawn as closely as possible to the pubis by the suspensory bandage, the patient is told to arise. If all parts of the work have been properly performed, it will be found that the patient can stand upright; that he can, when holding his heels and toes together, take up a small object lying immediately in front of his toes; that he can stand, walk, turn rapidly, sit down, get up, cross his legs absolutely without pain and with no sensation about his genitals further than the feeling of some bulk between his legs, which, however, is but slightly or not at all uncomfortable.

The exhilaration produced by the sudden cessation of local and reflex pains and the stopping of all constitutional effects thereof make the patient exceedingly willing to return in forty-eight hours for a second strapping. Usually the longitudinal straps will then be found loosely encasing the scrotum. A grooved director passed under the choker into the space between the scrotum and the plaster strips serves as a guide for strong scissors to cut the choker at the centre of its anterior aspect. The hair to which it is attached should be cut through, care being taken not to snip the skin. When all the hairs are cut, pass the scissors through the anterior aspect of the entire casing, which can then be easily removed. The swelling will then be found reduced to one-third or one-fifth of its former size. If any excoriations have resulted from defects in the dressing, they should be dusted with nosophen and cotton packed into a snugly fitting suspensory bandage applied over it. If no excoriations have resulted, and especially if some tenderness still remains, the strapping should be reapplied and repeated every forty-eight hours. Some cases may require as many as four such strapplings to reduce the inflammation to a subacute state, which then may be treated by applications of the Casper ointment on

gauze strips twice daily. These strips should then be covered by a thick layer of cotton and impermeable tissue over the cotton, all held firmly in place by a well-fitting suspensory bandage.

In some cases, having reached this stage, resorption of the swelling seems to be hastened by galvanism employed every second day. At the first séance the moistened negative electrode may be applied to the scrotum and the positive to the thigh. The séance may last five minutes and two milliamperes be employed. At the second séance the poles should be changed, the time lengthened to six minutes and the current increased to three milliamperes. At each subsequent séance the poles should be changed, the application extended one minute and the amperage increased one milliampere. The use of galvanism should not be carried to a painful degree and the site of application of the positive pole, while kept firmly applied, should be continually moved to prevent excoriations.

Sometimes the patient's timidity or the physician's lack of *fortiter in re* (never incompatible with *suaviter in modo*) prevents strapping the testicle in the class of cases cited. Then the indications for rest, elevation, warmth, and moisture can be approximately attained by the use of specially constructed suspensories. These were first suggested by Horand, and subsequently modified by Langlebert, von Zeissl, Casper, Falkson, Letzel, White and Martin, and others. They differ from suspensory bandages mentioned before, in being much larger, stronger, and adjustable not only in the body and perineal straps, but also in having adjustable scrotal bags. Their cost is, however, high. In cases in which the bandages mentioned before will not suffice, they certainly are serviceable. They are employed as was directed for their use after strapping.

A substitute for strapping and suspensories is devised by Karl Gerson,¹ of Berlin, who suggested the use of scrotal elevating strips.² These are strong elastic adhesive strips an inch wide, with one margin softly fringed. The end of the bandage has two small linen tapes. For use the scrotum is grasped be-

¹ Gerson: "Elastische Pflaster-Suspensionsbinden." Dermatologische Centralblätter, Heft iv., 1897; Berliner klinische Wochenschrift, No. 3, 1898.

² The words "scrotal elevating strips" are an intentional mistranslation of the author's "Suspensionsbinden," which in a literal version would cause confusion with the accepted English designation of suspensory bandages.

low, and by compressing the sac, its contents are forced upward to as near the inguinal ring as possible. The bandage, which readily adheres to the scrotum, is tightly wound about it, with the fringed edge upward, to prevent abrasion. When the whole is wrapped about the emptied scrotum, it is firmly tied by the linen tapes. This leaves a part of the emptied scrotum projecting below the bandage. The ease with which this manner of treating epididymitis can be employed, and the facility with which the patient can reduce its pressure, should it become too strong, are decided arguments in its favor. And indeed, in many cases (perhaps fifty per cent.) it acts quite satisfactorily. In some, however, the pain becomes so severe as to compel its removal, and in others it produces no appreciable effect.

In exceptionally severe cases of epididymitis or orcho-epididymitis, or when the patient cannot bear even a touch of the inflamed scrotal contents, and when the treatment described on page 59 will not afford relief, tobacco poultices will assuage the suffering. These are made of equal parts of common smoking tobacco and ground flaxseed, boiled together and applied as hot as can be comfortably borne. As soon as such a poultice begins to cool, a fresh one should be applied. At night they may be substituted by the Casper ointment.

While the inflammation is at its height, some authors still recommend crushed ice directly applied or used in an ice-bag. No relief is obtained by this treatment, which seems to increase the danger of abscess. It may be a mere coincidence that in every case I saw of loss of the testicle from gonorrhœal invasion of the scrotal contents, ice had been employed during epididymitis.

It is ordinarily held that from the very onset of epididymitis treatment of the urethra should be stopped. This idea is probably due to the usual diminution or entire arrest of the discharge when epididymitis begins. But in practice it is found that when the physician desists from treating the urethra during epididymitis, its subsidence is followed by a return of the discharge, usually far in excess of the original condition; while if irrigations are persistently continued despite the epididymitis, recurrence of the severe symptoms of gonorrhœa does not take place.

EPISPADIAS AND HYPOSPADIAS, when not so deforming the penis

as to make coitus impossible, are prone to interfere materially with successful irrigations. It is remarkable that men with very markedly deformed penes seek to gratify the genesic impulse. Their large exposure of mucous membrane makes them liable to more ready infection, and in these deformities, the ingenuity of the physician is often taxed for the successful employment of remedial measures. Owing to sacculations and deviations produced by these deformities, gonorrhœa, despite the best directed treatment, is prone to go over into chronicity. The case then is not likely to be finally cured before the urethra is restored by plastic operation.

EPITHELIUM IN THE URINE.—The only epithelium found in normal male urine comes from the bladder. Louis Heitzmann,¹ following the principles laid down by the lamented Carl Heitzmann, asserts that in addition to other microscopic evidences, the kind of epithelium found in the urine points out the region of the pathological process going on in the genito-urinary tract. Fantastic as this is asserted to be, I have almost daily evidence of the parallelism between microscopical and clinical diagnosis and always find it a decided aid. The details of the characteristics of the various epithelia, their application to diagnosis, would lead beyond the scope of this little book. Moreover, they are described by Heitzmann so fully as, in the light of our present knowledge, cannot be improved.

I would like to add an important fact to his description of the epithelia found in the urine of stricture cases, even when a pathological coarctation presents no other evidence of its presence. The urethral epithelia, then, have among them some thinned scales, with smoothed or faint nuclei and some without nuclei. These variations prove that stricture is forming and persists as long as they are present. The case must then be treated by dilatations and irrigations, as detailed under chronic gonorrhœa.

EYE, Gonorrhœal inflammation of—see Ophthalmia, gonorrhœal.

FIG WARTS—see Condylomata.

FISTULA, urethral. Whether congenital or the result of peri-urethral abscess or of urethral rupture from stricture, a urethral

¹ Heitzmann: Urinary Analysis and Diagnosis, William Wood & Co., 1899.

fistula is not likely to render irrigation especially difficult, unless the fistula is very large. If situated in the anterior urethra, it can ordinarily be covered by the finger during irrigation and evacuation of the bladder, when intravesical washings are employed. In that case it will be well to have the patient let some of the irrigation fluid pass through the fistula, so that its lining may receive antigonorrhoeal treatment at the same time. Perineal fistulæ do not usually offer much hindrance to irrigations. If, however, they do, on account of large dimensions, the patient can be instructed to hold them closed during irrigation.

"FLOATERS," in the urine. Macroscopically visible substances carried from the urethra by the urine are among the numerous genito-urinary subjects that still merit much detailed study. Many eminent authors have made painstaking researches regarding them; yet, until more precise devices and methods are employed, "floaters" in the urine will remain but partially understood as regards their origin and special pathological significance.

Their importance is well brought into relief by Guiard:¹

"It is safe to say with Fürbringer that the abnormal products contained in the first portion of the urine represent a more constant symptom of *goutte militaire* (morning drop) than the drop itself."

These objects carried in the urine are usually spoken of as filaments or clap threads (*Tripperfäden*) without description of any distinctions between their forms.

With a view to a clinical outline of their study I submit the generic term "floaters" for all these objects, fully conscious of its incompleteness, as it does not describe those, composed essentially of pus, which sink to the bottom of the glass containing fresh urine.

Roughly it may be said that these floaters differ in size, transparency, consistence, and conduct, according to the severity of the disease, its chronicity, and the progress of treatment. These relations, however, are by no means firmly established.

In studying these floaters, it must be remembered that there are floaters which have no relation whatever to disease. These

¹ Guiard : *Les Uréthrites chroniques*, Rueff, Paris, 1898.

* have been called normal mucous filaments by Guyon.¹ The first urine passed after a night's rest, during which the secretions of the mucosa and its glands have not been washed away, carries with it a long, wavy filament. At spots it is rolled upon itself. It is transparent, occasionally encloses minute air bubbles, whitish spots and streaks. It remains coherent on shaking the tube and sinks very



FIG. 17.—Normal Mucous Filament, from a healthy man, who never had urethritis. First morning urination. The mucous filament holds leucocytes and epithelia in series. $\times 300$ diameters. (From Guyon: "Voies Urinaires," vol. ii., page 363.)

slowly below the surface of the urine. Its coherence is still more manifest when grasped by forceps or fished by means of a needle; when withdrawn from the urine it stretches into great length as it is held suspended.

In consistence this normal filament suggests the discharge that comes from the prostate, in that it can be dragged about upon a cover glass, maintaining its tenuousness for a long time. When allowed to rest, it shows a tendency to form a colorless, amorphous heap. As it dries very slowly, its preparation for the microscope is quite tedious. Endeavors to spread it with the platinum loop result in uneven masses interspersed with hard lumps.

It is therefore best to press it between cover glasses while moving them about upon each other until an even smear is obtained. Even then, on separating the cover glasses, to let the specimen dry before flaming, its coherence is so great that it is likely again to run together into lumps.

The specimen properly spread, stains best with alkaline methylene blue. For fine distinction this solution should not

¹ Guyon: *Leçons cliniques sur les Maladies des Voies urinaires*, tome premier, Baillière, Paris, 1894.

be over two per cent. and left in contact with the specimen for five minutes before washing it off.

On examination this specimen is found to contain:

Mucous threads and bands with a tendency to curl; their meshes hold, isolated, in small groups or in rows:

Urethral flat epithelia with small nuclei;

Polyhedric or rounded epithelia with large nuclei;

Leucocytes, often in abundance.

The normal filament never has micro-organisms of any kind, not even the bacteria of the normal urethra. These bacteria are found in secretion taken from the meatus, lying amidst the large epithelial cells.

Not infrequently a healthy man learns that urethral filaments are evidence of disease. Unless the physician informs himself thoroughly of the appearance and other characteristics of the normal filament, and uses his knowledge to reassure his patient, the latter can develop most obstinate neurasthenia. If not convinced of the innocuousness of these normal filaments, he may get into the hands of quacks, who by maltreating the healthy urethra with injections or sounds, will set up an irritative urethritis with stricture or other complications in consequence.

The dimensions and shapes of pathological floaters in the urine differ according to the severity of the disease, its duration, and the results of treatment. These differences are subject to most marked variations. With a view to establishing a basis of recording cases, and consequently their more detailed study, I submit the following classification:

SHREDS, coarse, large, medium, small.

“ fine, “ “ “

FILAMENTS, coarse, long, medium, short.

“ fine, “ “ “

FLAKES, coarse and fine.

GRANULES, coarse and fine.

In offering the above, concise descriptive terminology is the sole object. It would be remiss to omit from this list the comma filaments, which, according to Fürbringer and Finger, are moulded to the comma shape within the prostatic duct in a diseased condition. When found, they usually are emitted with the last drops of urine.

The conduct and coherence of pathological floaters bear no re-

lation to their dimensions, nor have they as yet an established position in diagnosis. Guyon (*op. cit.*), however, advises retaining the designations of *purulent*, *muco-purulent*, and *mucous* floaters as clinical definitions.

Purulent floaters are short, multiple, opaque, friable, are easily broken up by shaking the urine, which they render turbid. They sink quickly (drop) to the bottom of the glass containing the urine.

Muco-purulent floaters are often single, long, knotted; sometimes one of their ends is rolled upon itself forming a sort of head. They look grayish-white and have opaque dots or stripes, held together by a transparent substance. They float toward the top or middle of the urine, and cohere almost as much as the normal filament when withdrawn for examination.

Mucous floaters appear as do those of a muco-purulent character. They differ, however, by remaining at or near the top of the urine column and in being almost entirely transparent.

The conduct of these floaters conveys the thought that there exists a variance in their specific gravity—mucus being lighter than urine and the floaters proportionately heavier—in accord with the amount of pus they contain. Their histological and bacteriological elements also contribute to the floating or sinking of the floaters. For their study the reader is referred to works on these subjects. One that embodies the most recent views is by Louis Heitzmann,¹ whose practical value for purposes of diagnosis is beyond calculation.

The examination of floaters, both macroscopic and microscopic, must be made from urine passed in the physician's office. For this purpose the urine brought in a bottle is worthless, as all floaters dissolve in a few hours.

Under appropriate treatment, the shreds soon become broken up into flakes, the long filaments into shorter ones, and as the disease nears its end, all floaters become converted into granules. These changes will be more fully discussed under the treatment of chronic gonorrhœa.

FOLLICULITIS—see Abscess, follicular and peri-urethral.

FOREIGN BODIES in the urethra may complicate and aggravate gonorrhœa. They may be due to bodies inserted into the ure-

¹Heitzmann: Urinary Analysis and Diagnosis by Microscopic and Chemical Examination, William Wood & Co., 1899.

thra, as has been done in attempts to alleviate itching or tickling, for masturbatory purpose, or by instruments breaking off when introduced for therapeutic objects. Of the articles inserted to allay itching or cause ejaculation, or broken off during surgical procedures, Englisch¹ mentions pins, bits of wood, twigs, grasses, roots, sponges, pipe stems, forks, catheters, cautery-carriers, pieces of forceps, etc.

Concretions formed above, or fragments left in the bladder after lithotripsy may be carried to the urethra and be pinned fast there by their sharp points penetrating the mucosa.

Foreign bodies (stones) may also form within the normal urethra; they then are usually located in the fossa, rarely within the bulb. They may also be deposited in congenital or acquired diverticulæ or fistulæ. They then usually are uric-acid stones.

Foreign bodies inserted or formed in the urethra may be carried upward by its motions and those of the bladder. The lengthenings and shortenings of the penis under varying emotions may mechanically explain this inward progress. This, of course, is interfered with when the foreign body is sharp or rough, causing its ingression into a consequent adhesion to the urethral wall.

A foreign body causes pain and the other inflammatory symptoms or an increase thereof, when these existed before its introduction. Efforts at urination, if the body is large, result in forcible distention of the urethra behind it, while the urine dribbles or drops from the meatus. If the body is very large or not promptly removed, retention may result, as may also abscess or extensive pockets of the urethra.

Palpation reveals the location of the foreign body. Swelling about it may deceive the fingers regarding its size and character.

If unduly left in the urethra, the urinary salts may form concretions about the foreign body.

The sudden establishment of localized pain within the urethra, besides the other disturbances, direct attention to the possibility of a foreign body having been introduced, although the fact may be strenuously denied by the patient. This is the only circumstance in which urethroscopy is justifiable in acute

¹ Englisch: "Die chirurgischhen Krankheiten der männlichen Harnröhre." Zuelzer and Oberlaender's *Klinisches Handbuch der Harn- und Sexualorgane*, vol. iii., Vogel, Leipzig, 1894.

gonorrhœa. The pain may be so severe as to require cocaine or eucaine before a tube can be introduced to the site of the foreign body. Great care must be exercised to prevent the substance from being thrust farther into the urethra by the obturator. If it can be grasped through the tube by the Guyon urethral forceps, a dull curette, Guyon's hood or an instrument improvised for the purpose to cover the special needs of the case, it may be withdrawn with or through the tube, if their relative sizes permit. Whenever a rough or sharp body can be drawn *through* the tube, this method is certainly preferable, as thus the urethra is protected from additional injuries. When the body is too large to pass through the urethroscopic tube, it must be removed by the most suitable of the many instruments devised for the purpose. When it is smooth and located in the pendulous portion, it may be pressed out of the urethra by careful manipulation. If, as occasionally happens, a man inserts a hair-pin or a hat-pin into the urethra, their points will be found presenting forward. Efforts at removal are likely to cause extensive gathering and penetration of the mucous folds. It will be well, to prevent such additional injury of whose extent the surgeon cannot judge at the time, to cause the points of such an instrument to penetrate the urethra at the centre of its floor and to turn the object by the projecting part so that its head presents forward. Then holding the projection firmly with strong forceps, the penis is stripped backward to cause the head to project from the meatus, so that it can be grasped by another forceps and withdrawn. It is better to thus risk a urethral fistula than to produce internal injuries of the urinary channel.

The surgeon's ingeniousness is often severely taxed for the removal of stones formed in the urethra. They may be contained there for a long time without producing any special disturbance. Slow or sudden accretions may, however, establish increasing inflammatory symptoms, with local swelling, urinary infiltration, formation of abscesses or diverticulæ, incontinence, chills, fever, pain at the site of the concretion or radiating pains through the penis. If not removed, nature may throw out the stone through extensive ulceration, producing large urinary fistulæ which are difficult and sometimes impossible to repair. If the stone or stones so formed are left in the urethra, the patient's life is in danger from sepsis.

If the stone cannot be removed through the urethra, external urethrotomy over it must be performed as soon as possible.

FRENUM, short or rigid. While extreme degrees of this deformity may render erection painful and intromission impossible, it does not safeguard the patient from acquiring gonorrhœa. It offers no material interference with irrigations; still, while the patient is under treatment, it may be well to slit the frenum to correct the deformity. In case of a timorous person, the little operation may be preceded by freezing the frenum with ethyl chloride. The glans is turned back, a narrow straight bistoury or tenotome passed through its base and the frenum cut from within outward. The cut may be dressed with iodoform or nosophen gauze and a light bandage applied to keep the foreskin retracted and prevent coaptation of the cut extremities.

FUNICULITIS. — Inflammation of the spermatic cord may manifest itself while the vas carries infection from posterior urethritis to the epididymis (see Epididymitis) or may independently complicate gonorrhœa especially by rheumatic phlebitis. It may appear in the form of serous funiculitis (acute diffuse hydrocele of the cord) or of phlegmonous funiculitis. The former shows itself as a roundish, sausage-like swelling along the cord, which is translucent and pits on pressure. Phlegmonous funiculitis manifests itself in the same shape, but it is not translucent and is very tender to pressure. From the acuity of the symptoms it may simulate strangulated hernia. It is the more dangerous form, as it may extend into the peritoneum.

Acute funiculitis in either form is treated as laid down under the lighter form of epididymitis. If the manifestations are so severe that the testicle is threatened, the funis should be incised and drained.

GENERAL GONORRHOEAL INFECTION.—Some of the complications mentioned here can have their explanation only in conveyance of gonococci through the circulation. P. Colombini¹ reports a case which signally illustrates this:

A mechanic, aged 28, had acute gonorrhœa; in two weeks he

¹ Colombini: "Bakteriologische und experimentelle Untersuchungen über einen merkwürdigen Fall von allgemeiner gonorrhöischer Infection." *Centralblatt für Bakteriologie*, vol. xxiv., No. 25.

developed an inguinal bubo, a week later an abscess of the epididymis, and eight days after that, suppuration of the parotid. The pus from all the abscesses, as well as the blood, was found to contain gonococci, from which pure cultures were obtained. Colombini found a boy of twenty who had never had gonorrhœa and who willingly submitted to having his urethra infected with one of these cultures. A florid gonorrhœa resulted, which required many months of assiduous and patient treatment for its cure.

Thümmel,¹ of Leipsic, in commenting on this case, says that the culture experiments should have sufficed Colombini for certainty that the diplococci found in the various abscesses and blood were true gonococci, and that humane sentiment should have forbidden imperilling the health and life of a young man, by so infecting him. Thümmel adds that if it seems necessary to make any such tests, the experimenter should use his own urethra for the purpose—a sentiment with which all will agree.

In a most explicit paper, which Berg² read before the Section of Practice, New York Academy of Medicine, he recites the details of a case whose death, twenty-nine days after the first symptoms of a gonorrhœa, was clearly due to systemic gonorrhœal infection of the heart and kidneys *without any lesion of the bladder or urethra*. The author's deductions and literary researches are so instructive that justice to the reader requires their entire reproduction.

"A large number of cases of ulcerative endocarditis complicating gonorrhœa have been reported. In the larger number of cases the heart lesion was preceded by gonorrhœal arthritis; thus Ricord and Hunter, according to Sée,³ believed that gonorrhœal rheumatism was sometimes complicated by rheumatic endocarditis. Desnos, however, in 1877 performed the first autopsy upon a case of endocarditis without rheumatism, complicating gonorrhœa; and other cases have since been reported in which arthritis was not present. Such a case was reported

¹Thümmel: Centralblatt für die Krankheiten der Harn- und Sexualorgane, July 15th, 1899.

²Henry V. Berg: "Pyelo-nephritis and Ulcerative Endocarditis as a Complication of Gonorrhœa—the Gonococcus found in Pure Culture upon the Diseased Heart Valve." Medical Record, April 29th, 1899.

³"Le Gonocoque," 1896.

by Morel.¹ That inflammatory complications occur in gonorrhœa has always been recognized. Many of them are due to direct extension of the process from the urethra or vagina into the deeper tissues connected with these tracts. Others are the result of direct inoculation of distant structures with gonorrhœal pus, as, for instance, gonorrhœal ophthalmia. Neither of these methods of infection would account for the production of a gonorrhœal endocarditis. Effects upon the nervous system and the manifestations of general sepsis could be explained by supposing that a toxin produced by the gonococcus had been absorbed into the lymphatic and circulatory system, but the finding of the gonococcus in pure culture in the vegetations on the valves of a case of ulcerative endocarditis complicating gonorrhœa would seem to prove that the gonococcus itself has been carried to the site of the lesion, and has there produced the ulcerative manifestation.

"For some time it was believed, when such an infection occurred, that it was the result of a mixed infection. As is well known, the urethra is the habitat, even in the normal state, of numerous varieties of germs, so that, when the mucous membrane of the urethra has been thrown into a pathological condition through the action of the gonococcus, the pyogenic germs would find a ready means of entering the system and producing distant lesions of a septic character. Thus Weichselbaum² reports a complete autopsy, with bacteriological investigation of a case, which certainly proved that ulcerative endocarditis can complicate gonorrhœa as a result of mixed infection, he having found gonococci and streptococci upon the valves. A similar case was published by Ely.³

"His⁴ and Wilms,⁵ although they both published cases of ulcerative endocarditis complicating gonorrhœa, in which the cocci found on the diseased valves had morphological characteristics of the gonococcus, and behaved in the characteristic

¹Thèse de Paris, No. 209, 1878.

²Centralblatt für Bacteriologie, 1887, 2, and "Zur Aetiologie der acuten Endocarditis," Ziegler's Beiträge, 1888, iv., 3.

³Medical Record, March 16th, 1889.

⁴Berliner klinische Wochenschrift, 1892, No. 40.

⁵Münchener med. Wochenschrift, 1893, No. 40.

manner toward Gram staining, yet considered that these cases were the result of mixed infection.

"But in the last few years, particularly since 1894, many excellent observers have reported cases in which there was found at the site of lesions complicating gonorrhœa only the gonococcus. Thus Bordone-Uffreduzzi¹ obtained the gonococcus in pure culture by inoculations made with the fluid from a joint affected by gonorrhœal arthritis. A gonorrhœa was produced in a human subject by inoculation with the second generation of pure cultures thus derived from the arthritic joint. Councilman² reports a case in which he obtained pure cultures, in a case of gonorrhœal septicæmia, from the joints, the pleura, the pericardium, and the valves of the heart. Councilman also quotes a case of Gluzinsky very similar to the case which my communication recounts, and Winterberg³ reports a similar case. One of the earliest cases of this kind was that of Leyden,⁴ in which, as in my case, the gonococcus was found after death. Cultures from the blood during life, and from the left ventricle after death, remained sterile.

"One of the most valuable cases was reported by Thayer and Blumer.⁵ In this case, in addition to pure cultures of gonococcus found in the valves, the blood cultures taken during life showed colonies of gonococcus which would seem to prove that the gonococci passed by means of the blood current to distant portions of the body, and there gave rise to infections.

"I think that at present we may believe that septic infections, such as occurred in my case, can be the result of the unaided action of the gonococcus distributed through the body by the blood channels."

The first conclusive proof of the gonococcus causing peritonitis was presented by Cushing,⁶ whose exhaustive investiga-

¹ Deutsche med. Wochenschrift, 1894, xx., p. 484.

² Trans. of the Association of American Physicians, 1893, viii., p. 165.

³ Festsch. zum 25jähr. Jubil. d. Vereins Deutsch. Aerzte zu San Francisco, 1894, p. 40.

⁴ Berliner klinische Wochenschrift, January 1st, 1894, xxxii., p. 22.

⁵ Arch. de Méd. expérimental., November 1st, 1895, vii., No. 6, p. 701.

⁶ Harvey W. Cushing: "Acute Diffuse Gonococcus Peritonitis." Bulletin of the Johns Hopkins Hospital, May, 1899.

tions add evidence to the fact that gonorrhœal processes are not limited to mucous surfaces.

Besides the joints, heart, and kidney, the fourth ventricle of the brain has been found the seat of gonococcal invasion through the circulation.

For detailed study of the gonococcus the reader is referred to the writings of the authors mentioned, and more particularly those of Henry Heimann.¹

GLEET.—This term is used to designate any kind of persistent discharge from the urethra. As it embraces no pathological or otherwise descriptive import, it should cease to have a place in medical nomenclature.

GOUT.—It is well known that gout can evince itself in urethritis, especially of the posterior urethra, in orchitis and epididymitis, although these manifestations are rare. When a gouty patient past middle age and given to high living, contracts gonorrhœa, the possibility of the constitutional complication should not be left out of mind. The urine, besides containing pus, is very acid and heavy with uric acid and urates. Suspicion is attracted to the possibility of a gouty diathesis by the presence of dry, scaly eczema, tophi, and ground-down teeth. In such cases irrigations must be followed out as in uncomplicated gonorrhœa, while the patient is energetically treated by his family physician for the gouty condition.

HEMORRHAGE.—While bleedings from the meatus of other than urethral origin would be beyond the scope of this book, their possibility must not be left out of consideration when they occur with a gonorrhœa.

The bleedings from posterior urethritis and urethrocystitis are discussed under their respective heads.

Bleeding from the anterior urethra may be provoked by violently employed strong injections, sharp syringes, catheterization through an acutely inflamed, macerated urethral mucosa, and the passage of small, rough calculi.

Sometimes urethral bleeding is provoked by coitus while the patient has gonorrhœa, incredible as such an act may ap-

¹ Heimann: "A Clinical and Bacteriological Study of the Gonococcus Neisser," Medical Record, June 22d, 1895. "A Further Study of the Biology of the Gonococcus," Medical Record, December 19th, 1896. "Further Studies, Third Series, on the Gonococcus Neisser," Medical Record, January 15th, 1898.

pear. S. Kofmann,¹ of Odessa, reports such a case. A healthy-looking individual, aged nineteen, with anxious features, told Kofmann that for over an hour blood had been pouring from his urethra in an uninterrupted stream. The patient confessed having gonorrhœa. Examination showed blood escaping from the meatus in jets as thick as a pencil, as from an artery transversely divided. Kofmann dipped a strip of gauze into a solution of alumina acetate, mounted it on a long button probe, carried it as deeply as possible into the urethra and packed it firmly. Then he applied a pressure bandage about the penis, ordered the patient to go to bed, to avoid urinating as long as possible, prescribed opium and forbade drinking. On the following day the patient looked better, but still considerably affected. On removing the pressure bandage and extracting the blood-soaked packing, considerable bleeding resulted. The whole dressing was repeated and the patient ordered to return on the following day. He did not do so until one and a half months later. He then related the history of gonorrhœa four years before, lasting one year. Later he had had chancroid, still later another gonorrhœa and chancre, and a third clap a year before the last consultation. The discharge was very copious and the patient suffered much pain, especially on urinating. Despite the disease, the patient cohabited several times. During one intercourse he experienced intense pain, and immediately thereafter found his linen blood-soaked and blood dripping from the meatus. Since then the bleeding had recurred frequently, especially after the abuse of stimulants. The bleeding then always came on after passing clear urine, sometimes in bright red drops, sometimes in a stream. Compression of the penis for some time always arrested the bleeding; this was followed by itching in the urethra, from which the patient extracted a coagulum cast in the shape of the channel. Upon its withdrawal, bleeding immediately recurred. On the day he consulted the author the patient had drunk several glasses of tea and a considerable quantity of brandy. Bleeding, which then set in upon urination, proved uncontrollable. On the day after the second tamponing the patient removed the bandage and the packing.

¹ Kofmann: "Zur Tamponade der Urethra." *Centralblatt der Chirurgie*, No. 19, 1899, quoted in *Monatsberichte über die Gesamtleistungen auf dem Gebiete der Krankheiten des Harn- und Sexualapparates*, July, 1899.

This was followed by a thick coagulum and several drops of blood. Then the bleeding stopped; the debility resulting from the loss of blood obliged the patient to remain in bed for two weeks. The origin of this bleeding was doubtless gonorrhœal injury to a blood-vessel deep in the urethra, with subsequent laceration of the vessel.

See also *Foreign bodies and Traumatism*.

HÆMOSPERMIA.—Red or brownish semen is due to the admixture of blood dependent upon very severe gonorrhœa or acute seminal vesiculitis. It is occasionally produced by masturbation, chronic orchitis, or chronic gonorrhœa. In vesiculitis the spermatozoa are deformed, dead, or absent. The microscopic specimens also show red blood corpuscles, pigment, granular detritus, epithelia varying in accord with the region affected, and round cells.

The most aggravated case of hæmospermia that ever came under my notice was that of a man of twenty-eight sent to me for complete loss of sexual desire, erections, and even nocturnal emissions. Six months before he, for the amusement of some comrades of his own intellectual calibre, had four prostitutes perform buccal masturbation upon him in immediate succession. At the fourth ejaculation he fainted, and remained unconscious for a long while. The physician who was called found blood oozing from the meatus. This continued for several hours.

No pathological conditions were discernible when I examined him. Under the use of tonics, galvanism, faradization and the psychrophore, he undeservedly recovered his potency in two years.

For the treatment of hæmospermia, see Vesiculitis and Digital Palpation of the Urethral Adnexa.

HYDROCELE.—When epididymitis, orchitis, or orcho-epididymitis complicates gonorrhœa, the extension of the inflammation is not rarely accompanied by acute hydrocele. The effusion is often so slight as to be barely perceptible and, in the majority of cases is resorbed, when the local inflammation subsides without any treatment being directed to it.

When the swelling is very great and produces much painful tension, it is necessary, for purposes of differential diagnosis, to ascertain whether it is caused by serous effusion. The local pain, too severe to permit manipulation, is intensified when the

patient is placed in the standing position to secure transillumination of the scrotal sac.

In such cases, the simplified urethroscope described on page 190 will fully serve, without in any manner increasing the patient's discomfort. The light is inserted into a large urethroscopic tube; its mouth is passed over the side of the scrotum opposite the surgeon's eyes, while the patient, whose testicles are elevated as described under epididymitis, is not disturbed at all. If the swelling is due to acute hydrocele, the light will pass through the scrotal layers and the fluid, but not through the testicle, whose body can be clearly outlined.

If the pain does not yield to the treatment directed against gonorrhœal epididymitis, relief may be promptly obtained by puncturing the sac with a very fine narrow-bladed knife. At each withdrawal of the knife, a few drops of the yellowish effusion will squirt from the tumor. According to its size, fifteen to fifty such punctures may be required. The pain is trifling, and the reduction of pain immediate.

Consideration of hydrocele as an individual disease, resulting from or preceding gonorrhœa, must be relegated to the large, recent works on genito-urinary diseases.

LYMPHADENITIS GONORRHOÏCA (gonorrhœal bubo) may complicate gonorrhœa if the patient commits any kind of excesses, indulges in violent or too prolonged exercise, or stands for many hours, as book-keepers, etc., must. Then one or more of the superficial glands in the subcutaneous cellular tissue, above the fascia lata, and immediately below Poupart's ligament, may be affected.

The physician who makes it a rule to examine his cases at each visit, is likely to discover and often abort lymphadenitis before the patient becomes conscious of it. The first sign of lymphangitis (see below) should direct attention to the groin. If a single or double hard swelling is found there, and even if it is not painful or only slightly sensitive to pressure, it should be treated as mentioned below.

If the patient's attention is attracted to these glands by pain, it will be found that the pain is increased by pressure and by standing. Early in the involvement of these glands, they are movable under the skin. Soon, however, they become adherent to it and the tissues around it. The region loses its hard con-

tour, becomes doughy, and assumes a reddened and later on a purple color. Even then, when properly treated, the inflammation may terminate in resolution, unless the patient's resistance is weakened by dissipation, excessive work, malnutrition, or a "scrofulous constitution." Then the glands affected are likely to suppurate.

At the first sign of such glandular enlargement, prolonged hot hip-baths, and mercurial ointment U. S. P. rubbed into the region twice daily may abort the case. Pressure upon the enlarged gland, with a well-applied spica of the groin, if the patient must be about, may assist in resorption of the swelling. Its effect may be increased by neatly fitting a compressed sponge over the gland, and wetting it after the spica is applied. If the patient can remain abed, a stout bag containing three to five pounds of bird-shot may be fixed upon the groin, so that its weight exercises continuous pressure upon the gland.

If in forty-eight hours the above course has not brought about marked relief, the enlarged gland or glands should be dissected out. Ordinarily this can be very well done under infiltration anæsthesia by Schleich's method.

If the patient is timorous or the physician of limited surgical experience, the region may be anæsthetized with ethyl-chloride spray and the enlarged gland slit. After bleeding is arrested the cut must be irrigated with hot water or hot boric-acid solution, and then filled with antinosin. This is retained by a covering of gauze and a spica. After two or three daily repetitions of this washing and dressing, the wound will be found filled with healthy granulations. Then nosophen dusted into it and the spica applied will ordinarily result in prompt cicatrization.

If the case is not seen until the gland has become converted into an abscess, evacuation of its contents must be at once attained by free incision and curetting the cavity, which then must be treated as above indicated, or by packing with iodoform or nosophen gauze.

LYMPHANGITIS.—Persons who have no idea of cleanliness, or those with a tight meatus, or those employing dressings of the glans that invite retention of gonorrhœal discharge, are likely to suffer inflammation of the lymphatics of the penis.

At the very inception one or two superficial, diffuse, faint,

reddish lines show along the dorsum of the organ. They are rarely, if ever, observed by the patient in this stage. A day or two later this discoloration disappears and one or two distinct cords can be felt beneath the skin. These cords may start near the frenum, pass like a bridle upward and backward behind the region of the corona to the dorsum and extend to the pubis. As the skin over this cord or cords becomes reddened again, pain sets in, which increases with the thickening of the lymphatics involved. This pain is much aggravated during erection. With the increase of pain, the skin that was freely movable over the enlarged lymphatics sometimes becomes adherent and very sensitive even to contact of the clothing.

In most exceptional cases, a spot anywhere along the dorsal lymphatics hardens, lies in the loose connective tissue, where it enlarges, giving but little inconvenience. The lymphatics behind such a knot are then not enlarged. The knot itself eventually breaks down into an ordinary abscess.

When a case of gonorrhœa presents, showing the preliminary light red lines, they subside after one or two irrigations, with all the precautions for cleanliness described under the technique of irrigation.

If thickening of the lymphatics has set in, in addition to irrigations, the penis is kept enveloped in cloths wet with equal parts of alcohol and lead water, renewed whenever they begin to get warm. Severe cases may require the patient to keep abed, to rise only for hot sitz-baths, or entire hot baths three or four times daily. If erections are frequent and painful, either monobromate of camphor or bromide of potassium generally controls them. These drugs failing, morphine may be used. Throughout, attention must be given to free intestinal evacuation.

If the case has progressed to suppuration, the abscess must be promptly opened, curetted, and packed with iodoform or nosophen gauze.

NEUROSSES (gonorrhœal).—While most diseases carry with them more or less marked nervous depression, there is none in which it is more evident or more frequent than gonorrhœa. The cause of nervous manifestations even at the inception of clap may be attributable to the consciousness of being physically unclean, or of being a menace to others; or they may be at-

tributable to the deprivation from habitual sexual intercourse or stimulants. More recent investigations, however, make it appear that the gonococcus toxins directly attack the nervous system. At all events Leleneff¹ reports the following disturbances of the nervous system produced by gonorrhœa:

(1) Changes in the sensory nerves, causing anæsthesia, hyperæsthesia, paræsthesia, and pain in the nerves, in the skin, in joints, in muscles, and in internal organs; (2) changes in the vasomotor nerves, causing hyperæmia, anæmia, paralysis of vessels, and dermographism; (3) changes in the secretory nerves, causing increased or diminished sweating, local sweating, an increase in the flow of mucus from the urethra, etc.; (4) changes in the trophic nerves, causing some forms of skin disease, atrophy of the testicle, and muscular atrophy; (5) changes in the motor nerves, causing paresis, paralyzes, and twitchings; (6) changes in the skin reflexes and tendon reflexes. Gonorrhœal affections of the central nervous system give rise to a variety of symptoms, such as asthenic neuropsychosis, neurasthenia, hemiplegic phenomena, etc.

These disturbances, however, seem to premise that gonorrhœa, to produce them, must be implanted upon an existing neurotic tendency. Beard² has shown that Americans are more prone to this complication than are patients of other nationalities. He attributes this to our unfavorable climate, overwork, anxiety, excesses in tobacco and alcohol.

This view is confirmed by my observations in European genito-urinary dispensaries and hospitals, where neurasthenia complicating gonorrhœa is certainly far less frequent than it is among us.

Von Krafft-Ebing³ reports only eight cases in which local genito-urinary disease was manifest in one hundred and fourteen cases of neurasthenia.

Löwenfeld⁴ is of the opinion that most of those afflicted with

¹ Leleneff: "The Nervous System in Gonorrhœa." *Wratch*, No. 4, 1899, excerpted by *Medical Record*, July 15th, 1899.

² Beard: "Sexual Neurasthenia."

³ Von Krafft-Ebing: "Ueber Neurasthenia Sexualis beim Manne." *Wiener medicinische Presse*, No. 5 *et seq.*, 1887.

⁴ Löwenfeld: "Sexualleben und Nervenleiden," *Bergmann*, Wiesbaden, 1899.

clap-neurasthenia are individuals with hypochondriacal predisposition, in whom the consciousness of suffering from a genital affection evokes persistent mental depression and frequently most exaggerated worry regarding its possible consequences. Such a patient continually directs his thoughts to the condition of his urethra, watches its secretions with anxious care, and submits to interminable attempts at curing it with astringents and cauterizants. This author concludes that clap-neurasthenia is more frequently the result of chronic maltreatment of the urethra than of its disease.

Every practitioner, and particularly every specialist, has seen innumerable cases in which urethritis has been maintained indefinitely by over-treatment, even when the methods employed correctly met the indications while the disease existed.

Naturally then, when discharge and floaters in the urine are made to continue by urethral maltreatment, or continuance of treatment when it has become unnecessary, the neuroses provoked by the manifestations of apparent disease must continue. The more persistent these neuroses are, the more difficult their cure becomes.

When all discharge has ceased, the presence of floaters in the urine, which may continue for several weeks after a gonorrhoea has subsided, may disturb the patient's mind. Some patients, even when the urine is perfectly clear, acquire remarkable dexterity in stripping the urethra, by which they can at almost any time produce a minute drop of normal secretion at the meatus, to which they point as evidence of their uncured condition.

When in such cases the urethroscope shows the absence of disease, it is the physician's duty to direct his treatment to the mental condition, lest the patient be driven by its persistence to the quacks, who will gratify the patient's desire for active local maltreatment as long as he can pay for it. Arguments and evidence of the microscope are only exceptionally of avail. The more palpable the physician's honesty is, the less he will be able, as a rule, to convince such a patient that the healthy urethra must be left alone.

Under such circumstances, it is perfectly justifiable to persuade such a patient that the passed gonorrhoea has affected his constitution and that he requires constitutional treatment for

its cure. Ordinarily the drugs administered must, to be effective, have a decided taste, such as tincture of nux vomica in watery solution. It will be well to warn such patients against the disastrous effects of "squeezing out the perennial drop" while taking this drug or any other that may be used. (See also Chronic Gonorrhœa.)

If the neurasthenia persists despite all suggestive treatment that the physician's ingenuity may devise to suit the special manifestations in each case, or the peculiar bent the mind has taken, the patient should be referred to a neurologist, because then it has gone beyond the field of general practice or the genito-urinary specialty.

It must, however, never be forgotten that a very minute urethral lesion can maintain a neurotic condition, even when not the slightest discharge can be brought to the meatus and the urine remains perfectly clear. If such a lesion exists, it can be found. When it is properly treated, the neurasthenia subsides with or shortly after its disappearance.

When gonorrhœa has destroyed tissues or organs through changes in the trophic nerves, surgical intervention may be required, to restore the patient's nervous and mental equilibrium. Several cases are reported in which an atrophied testicle was substituted by a celluloid body, with satisfactory results, as far as the patient's mental state was concerned.

CEDEMA of the skin of the penis may complicate gonorrhœa, especially in persons who keep the organ in a filthy condition. It subsides with attention to cleanliness.

In a number of cases, an immense œdema of all the tissues of the penis sets in almost immediately after the first or second irrigation. This is painless and disturbs the patient in no wise, except by the sensation of a large bulk in the trousers. In the majority of cases, when this œdema occurs, the gonorrhœa will be aborted in a very short time, probably because then no parts of the organ remain a favorable culture medium for gonococci.

OPHTHALMIA, gonorrhœal.—Whenever a patient with gonorrhœa, or one who has come in contact with the disease, shows a slight reddening of the conjunctiva, with an increased flow of tears, the latter should be examined microscopically. Whether gonococci are found or not, the patient should without a moment's loss of time be referred to an ophthalmologist.

If a specialist in eye diseases is not instantly accessible, the patient should be put to bed and, until the ophthalmologist arrives, small compresses taken from a block of ice must be put upon the eye, every two or three minutes, day and night.

Silver nitrate, as laid down in works on ophthalmology, should be employed as soon as the secretion becomes creamy. The healthy eye should be protected by an occlusive dressing. Buller's dressing has the advantage of permitting continual in-

spection and consequent early treatment, if the healthy eye has become infected.

ORCHI - EPIDIDYMITIS—see Epididymitis.

PARAPHIMOSIS complicating gonorrhœa does not frequently assume a severe form, and it usually subsides as the gonorrhœa improves. When, however, a patient attempts forcibly to reduce a gonorrhœal phimosis and manages to slip the fore-

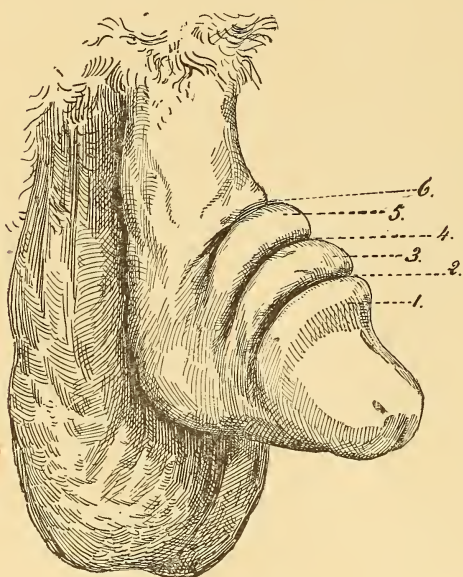


FIG. 18.—Paraphimosis.

skin beyond the glans, the preputial orifice soon becomes rigid, constricts the penis, which then swells, producing the familiar deformity. If the constriction and consequent œdema are not promptly relieved, the penis presents three distinct swellings and three more or less deep contractures, as shown on the accompanying drawing.

1. The margin of the corona is much swollen, forming a thick ridge.

2. The coronary sulcus rendered deeper by the swelling around it.

3. Glistening mucous fold sometimes overlapping the sulcus

and glans, formed of that part of the preputial mucosa that lay upon the posterior aspect of the corona.

4. A very deep, tight, constricting band; this is the preputial cutaneo-mucous margin, and, being the real point of constriction, is the cause of the trouble in this position. It is the surgical point of paraphimosis, the one that must be severed when operation becomes necessary.

5. Behind the hard constriction is another thick roll, consisting of preputial integument crowded back and held there by the constriction.

6. Another furrow, less deep and less tight than the former, is formed by the swollen tissues crowding back upon those that are not involved in the constriction before them.

This general type of paraphimosis may suffer a number of variations: the rolls of mucosa and skin may become so thick as to cover the furrows beneath them; the penis may be so constricted at the second furrow as to make it look as if bent forward at a right angle upon itself; the constriction may be lateral, giving the penis a twisted appearance.

When dislocation backward of the prepuce is recent, it may often be reduced by manipulation, after soaking the penis in a hot antiseptic solution for twenty or thirty minutes. Then, after drying the organ, a little vaseline or lubrichondrin is applied within the second constricting furrow, but nowhere else, lest it render the organ too slippery for manipulation. The penis is then grasped and steadied by the index and middle fingers of both hands, passed from both sides so that the tips of the indices touch each other on the dorsum, while the middle fingers cross below. In this position the fingers compress the third roll, while the thumbs perform a species of massage upon the glans as they strive to crowd it back within the prepuce. If it will yield at all, it will do so in a few minutes of this manipulation.

If the paraphimosis cannot be reduced by manipulation, or if efforts to perform it are excessively painful, or if the constriction has become too dense to yield, it will be promptly relieved by incision in most cases.

Neglected cases usually end by necrosis at the central dorsal point of the second furrow. Following this indication, the surgeon passes a sharp-pointed, curved, narrow bistoury be-

neath the constriction, gathering it upon its edge as if it were a cord. In doing so, he takes care not to wound the corpora cavernosa. In severing the "cord" it may impart quite a cartilaginous sensation to the knife. If the first cut is not successful in relieving the tension, a second may be made.

In case the swelling so overlaps or distorts the furrows that the second one cannot be found, a straight, narrow knife is used instead of a curved one. The penis is then rested in the palm of the left hand while the thumb and fingers depress and render tense the folds. Then the skin and mucous membrane are incised firmly, holding the knife perpendicularly to the axis of the penis, but not cutting more deeply than the integumentary coverings. These incisions must be continued until the constriction is felt to give way. In such case the incisions along the dorsum of the penis should be no longer than the length of the glans.

When the constriction has been severed, the foreskin can as a rule be easily drawn forward. It will then appear as if it had been slit. Ordinarily the cut heals soon, leaving a dog's-ear foreskin, which subsequently may be remedied by complete circumcision.

PERIARTHRITIS—see *Rheumatism*.

PHIMOSIS.—While many fine distinctions are made by authors regarding irretractibility of the foreskin, Taylor's¹ definition embraces all practical requirements: "Phimosis is that condition of the prepuce which prevents its retraction and the exposure of the glans. It may be congenital or acquired."

Many boys are born with a redundant prepuce. With some it is so tight that it cannot be withdrawn. It is debatable whether any boys are born with adhesions of the prepuce to the glans; at all events, in most of those whom I have circumcised, the prepuce had at least a few adherences. In some the adherence was so general as to oblige complete dissection of the inner lining from the glans.

The growth of the prepuce sometimes does not keep pace with that of the rest of the organ. The result may be an arrest of development of the glans. In one case treated in my class in the New York School of Clinical Medicine, the patient, a

¹ Taylor: Venereal Diseases, Lea Brothers & Co., Philadelphia, 1895.

negro, aged thirty-eight, had a fully developed penis, except as to the glans, which was no larger than that of a small boy of twelve years. After liberation of the glans by circumcision of a very small, tight, thick, unyielding foreskin, the glans began to develop and in three months' time attained almost its normal dimensions.

A tight foreskin, even when not redundant, by its irritation is likely to provoke masturbation. Normal secretions, or drops of urine retained and decomposed within the preputial sac, may cause ulcerations and heavy strong adhesions whenever these ulcerations heal. Concretions of smegma, sometimes quite hard and friable, are often found lying about the glans, and especially in the coronary sulcus. Urinary salts are sometimes deposited in this region. All these substances act as foreign bodies eroding the delicate mucosa; by accretion they may become adherent, embedded, and often produce extensive ulcerations.

Local symptoms of phimosis may be entirely absent, the mucosa accustoming itself to the irritation even of inspissated pieces of smegma or urinary concretions. They then will be discovered only accidentally or when an infection obliges the patient to seek professional advice. Ordinarily, however, there is at least heat about the glans. More frequently all the local evidences of balanitis or balanoposthitis with their consequences—new adhesions, venereal warts and fissures—call for treatment.

Phimosis may lead to obstructive conditions due to the adhesions, retained secretions, or subpreputial calculi mentioned above, or the preputial orifice may be so tight as to prove an obstruction to the free emission of urine. Then vesical irritability, dilatation of the bladder, ureters, and renal pelvis may obtain. Hemorrhoids and hernia may also result from the heavy pressure required in attempts to force the urine through the obstacles.

The liberal supply of nerves to the glans, when pressed upon by a tight foreskin and its local results, often reflexly evokes diseases such as convulsions in children, urinary retention and incontinence, unduly frequent erections, excessive seminal emissions, spastic paralyses, pseudo-hip-joint disease, muscular incoördination, etc. Naturally their presence with or developing in a phimosed patient does not make the tight fore-

skin the only etiological factor; still, its possibility must not be overlooked.

When phimosis develops from neglected gonorrhœa, it ordinarily subsides shortly after beginning irrigations, unless heavy

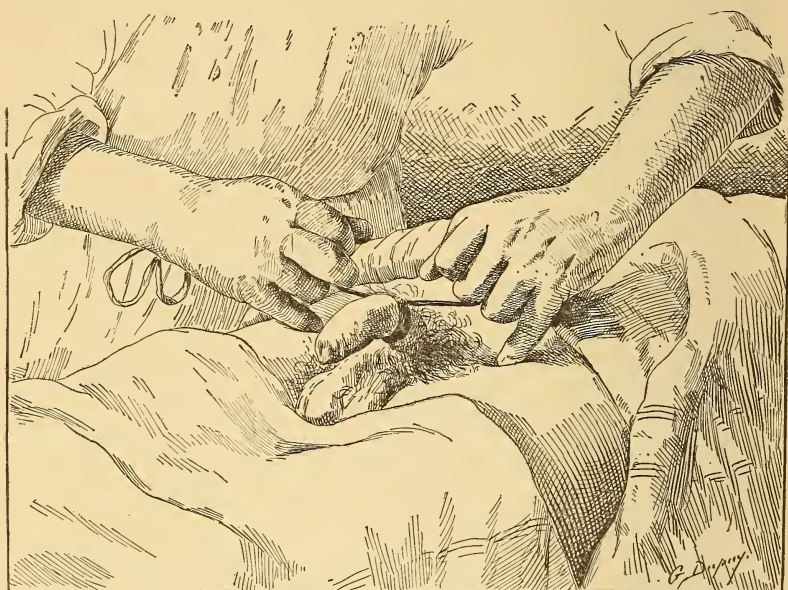


FIG. 19.—Applying Constrictor.

lymph deposits have organized in the preputial tissues. In such cases, or when phimosis precedes gonorrhœa, circumcision should be performed as soon as the more acute symptoms have subsided. But when the preputial orifice is so small as to prevent exposure of the meatus, or when adhesions are so numerous and tight that the glans cannot be cleansed, circumcision will be required despite the acute gonorrhœa.

The objections that may be offered to circumcision during acute gonorrhœa are:

1. Possible infection of the wound, especially when the urethritis is of a mixed character.
2. Difficulty of manipulation of the penis, as in irrigations, before the circumcision wound has healed.

To prevent infection of the cut, as far as possible while the patient has acute clap, a continuous stream of mercuric bichlo-

ride 1:30,000 should be kept running over the entire field of operation, from its beginning to its end.

The other objection is easily overcome by the circumcision I invariably practise, which may be concisely described in the following directions:

1. Thoroughly scrub the penis, and especially as much of the mucous fold of the prepuce as can be reached, with soap and hot water.

2. Irrigate the preputial sac with hot potassic permanganate solution 1:6,000 until the fluid that flows from it is entirely clear.

3. Envelop the anterior four-fifths of the penis in absorbent cotton soaked in mercuric bichloride 1:2,000.

4. Tie a rubber band as tightly as it can be drawn around the root of the penis (Fig. 19). As brutal as this precaution against



FIG. 20.—Freezing Tip of Foreskin.

hemorrhage may appear, it is quite painless, and its only result is some ecchymosis of the penis, which subsides in a few days.

5. Pass a probe as large as the preputial orifice will admit into the sac and sweep it around all its parts to ascertain if the prepuce is anywhere adherent.

6. Freeze a small spot at the tip of the foreskin with ethyl chloride (Fig. 20).

7. Inject into the frozen spot a drop of Schleich's¹ solution No. 1 (Fig. 21).

8. At the posterior margin of the bleb so produced inject another drop within the skin. Continue the line of drops along



FIG. 21.—Injecting First Drop of Anæsthetic Solution.

the dorsal aspect of the prepuce to a quarter of an inch beyond the point where the elevated margin of the corona is felt through the foreskin.

9. Inject a similar line of drops following the line of the coronary margin until the region of the frenum is reached on one side. Repeat this procedure on the other side.

10. Keep the syringe loaded for more infiltration, especially when the preputial orifice is so tight that the mucosa cannot be exposed.

11. Pinch up the dorsal aspect of the prepuce with the left thumb and index finger.

12. Insert the blunt arm of a pair of probe-pointed scissors and carry it back as far as possible toward the corona. Drop the prepuce upon the blade of the scissors; inexperienced operators

¹Schleich: *Schmerzlose Operationen*, Springer, Berlin, 1894.

will do well to sweep the scissors about under the foreskin, while the left fingers feel it, especially in infants, to be sure that the scissors arm is not within the urethra (Fig. 22).

13. Draw back the skin and thus render it as tense as possible. Cut through the part of the foreskin that lies between the scissors blades. This will produce a large cut through the skin and a disproportionately small cut into the mucosa (Fig. 23).

14. Grasp the cut angles of the skin and mucosa with artery clamps, hold one in the left hand and give the other to an assistant. While the mucosa is thus tensely held, infiltrate drops of the Schleich solution along the mucosa as far as possible in a line toward the corona. Cut the mucosa as far as this line goes. Repeat the linear infiltration in the part that is now ex-



FIG. 22.—Inserting Scissors.

posed. Continue cutting and infiltrating to within three-eighths of an inch of the corona.

15. Repeat the entire procedure along the lateral lines reaching from the dorsum of the prepuce to the frenum, on both sides, leaving a collar of mucosa three-eighths of an inch wide. Let the prepuce then hang from the region of the frenum, to serve as a convenient handle for further manipulations (Fig. 24).

No bleeding, beyond a slight oozing, will interfere with the above steps, if the rubber band about the root of the penis has been firmly applied. Should bleeding to a disturbing extent set in, another and tighter band around the root of the penis will remedy the defect, or the bleeding vessels may be ligated.

16. Pass a needle armed with six inches of 0 or 00 catgut through the mucosa, at the centre of the dorsum of the penis. A straight Gentile's (Fig. 26) modification of the Hagedorn needle will be found admirable for quick work. The needle



FIG. 23.—First Dorsal Incision.

should transfix the mucosa at one-eighth inch from its cut margin. Take up the skin in the same manner and tie the skin and mucosa into neat, tight, but not wrinkled apposition, with a double surgical knot. Take care that the cut edges of skin and mucosa embrace no cellular tissue. Grasp the free ends of the catgut in the jaws of an artery forceps and lay it on the abdomen which has been covered with a sterilized towel. This will serve to readily distinguish it from the other sutures at the close of the operation.

17. Apply similar sutures, each six inches long, to bring skin and mucous membrane together around the entire cut edges,



FIG. 24.—Lateral Incision.

until within one-fourth inch of each side of the frenum. Always take care that no connective tissue is allowed to project between the lips of the wound, which would then not have the advantage

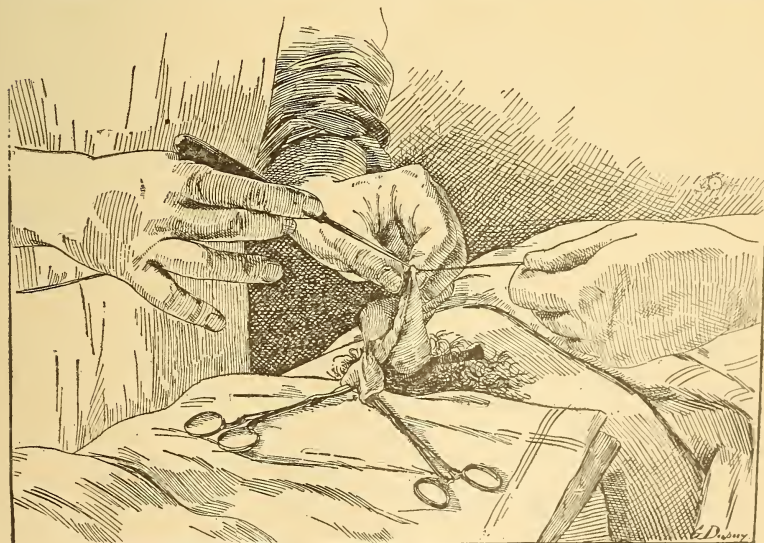


FIG. 25.—Inserting the First (Dorsal) Suture.

of primary union. Wherever a bit of this tissue cannot be forced back to remain, another suturing of skin to mucosa over it will accomplish the desired end. After knotting each suture at the wound lips, tie its free ends together in a slip knot so that each pair of sutures can be easily found together at the conclusion of the operation.

18. Raise the prepuce where it hangs from the frenum and replace the skin and mucosa in their original relative positions. While an assistant so stretches the foreskin, pierce its base along the frenum with a needle armed with six inches of catgut twice the thickness of that used before.

19. Give the ends of the suture to the assistant who stretches it at a tangent to the axis of the penis. Take the prepuce in the left fingers, raising the penis. Then, avoiding the suture held by the assistant, cut off the foreskin neatly along the line of the frenum. Tie the ligature to bring the skin in coaptation with the exposed part of the cut frenum. Grasp the ends of the suture with an artery clamp, and place it upon the scrotum, which has been covered with a sterilized towel.

20. Examine the entire line of sutures, to be sure that neat coaptation is everywhere obtained. Wherever connective tissue projects between the lips it must be returned, and if it will not remain beneath the lips, an additional suture placed over it.

21. Slowly relax the rubber band that constricts the root of the penis. In a few moments there may be some oozing from the lips of the wound. If more than mere oozing results, additional sutures will control the bleeding.

22. Fold a strip of ten-per-cent. iodoform gauze or three-per-cent. nosophen gauze, eight inches long by one and one-half inches wide, into four smooth, equal, longitudinal folds. Have it stretched by the assistant (Fig. 30) at right angles over the first suture, whose ends are held by the artery clamp lying on the abdomen.

23. Release the suture from its clamp, separate its ends, and pass them around the gauze. Tie the gauze firmly against the



Fig. 26.—Gentile's Hagedorn Needle.



FIG. 27.—Disposal of First Suture.



FIG. 28.—Lateral Sutures Applied.

first knot, by which the skin and mucosa were brought together. Repeat this procedure with each suture, whose corresponding ends, though now all are matted together with blood, can be easily found, because they were tied together with a slip-knot. The gauze must everywhere be laid smoothly upon the wound lips; its tension must be even.

24. When both ends of the gauze are hanging from the last suture at either side of the frenum, release the suture from the

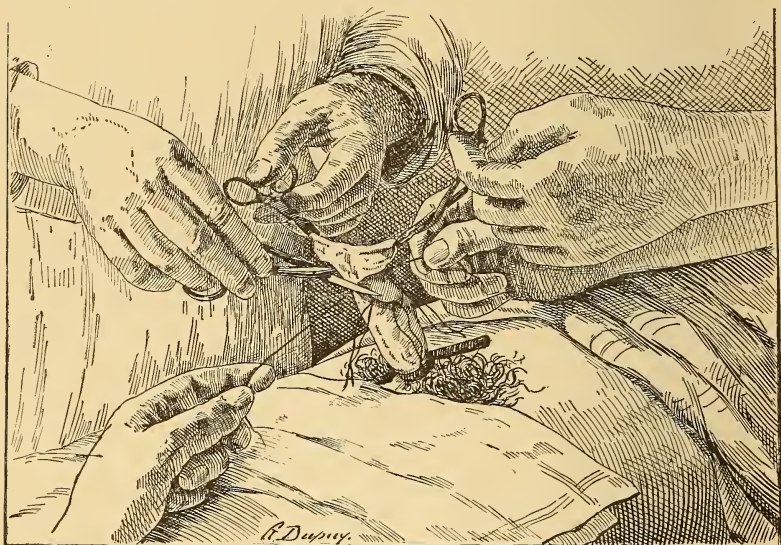


FIG. 29.—Cutting Off Prepuce.

NOTE: Two gentlemen assisted at the operation above depicted. When performed with one assistant the upper end of the frenal suture can be held by the ring and little fingers of the hand that holds the clamp.

clamp lying on the scrotum and give its ends to the assistant, who stretches them apart while placing the penis on the pubis.

25. Take the gauze strip pendent from the left side and lay it smoothly to the right side of the penis, upon the knot of the suture being stretched by the assistant. Then place the end of gauze pendent from the right side and cross it to the left (Fig. 31). Firmly tie the two ends of gauze within the last suture.

26. Cut off the projecting ends of gauze and trim the catgut sutures beyond their knots, leaving a smooth neat collar of gauze, about a quarter of an inch behind the corona, firm enough to press any ununited parts of the wound into coaptation, but

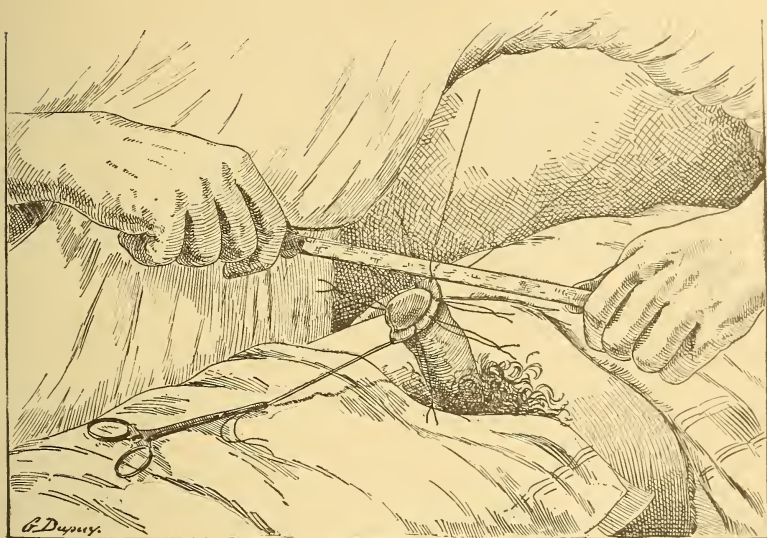


FIG. 30.—Applying Gauze Collar.

not tight enough to exert the slightest pressure upon the penis or give pain during erection (Fig. 32).

A little blood will ooze into the collar. This will swell

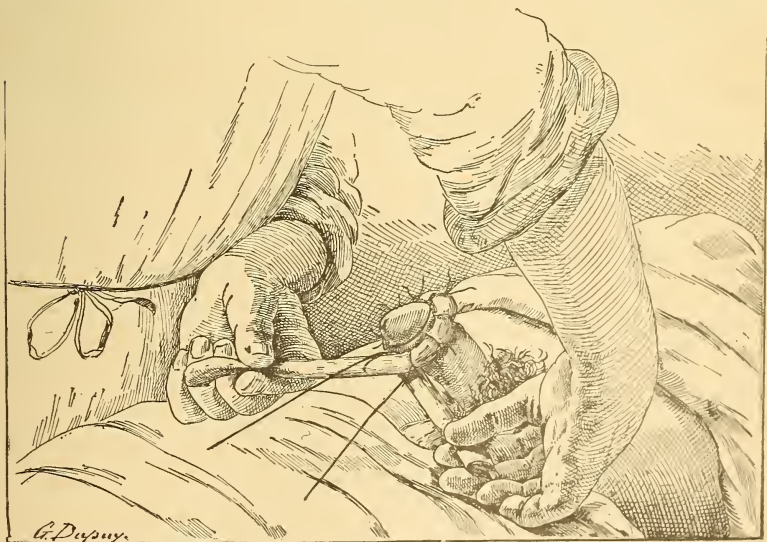


FIG. 31.—Closing Gauze Collar.

slightly, and in so doing press any little gapings of the wound lips together.

A light gauze bandage will steady the ring in walking. It should be so applied as to leave the whole glans free, that none of the dressing be soiled by urination. As the glans, so exposed, would suffer from friction with the clothing, it must be covered thickly with vaseline, over which a wad of absorbent cotton is placed and tied around the penis with a strip of gauze.



FIG. 32.—Circumcision Completed.

After each urination, fresh vaseline and cotton are applied by the patient. In two or three days the mucosa over the glans will be sufficiently hardened to render this protection unnecessary.

If the patient requires treatment for gonorrhoea, irrigations can be performed, and by using a little additional care in handling the penis, without pain from the operation.

Ordinarily, *i.e.* when the patient requires no treatment for gonorrhoea that moistens this dressing, the gauze ring will in a day become as hard as stiff pasteboard. In from four to eight days the catgut holding the wound lips together will be absorbed; the ring will then drop off, leaving the line of primary

union in evidence of the care and neatness with which the operation has been performed.

In circumcising children or unruly boys, general anæsthesia proves preferable to infiltration. When the latter is properly employed, it renders the entire operation absolutely painless.

When phimosis accompanies gonorrhœa, associated with chancre or chancroid, the danger of sloughing of the wound prohibits circumcision. As, however, the clap must be treated and as the sores may produce large destruction of tissue, unless they receive attention, it becomes necessary to expose the glans entirely. This is best accomplished by two lateral incisions, one on each side of the penis, half-way between the frenum and the dorsal median line of the foreskin. In most cases, Taylor's phimosis scissors will be found useful; still as often very hard preputial infiltrations may render its employment difficult, a stout, slightly curved sharp-point bistoury will be found more effective. It is passed upon a grooved director which has been inserted into the coronary sulcus, the preputial skin drawn back as far as possible, the knife made to penetrate the mucosa, the intervening tissue and to project from the skin, cuts a steady, straight line outward. This cut is repeated on the opposite side.

The operation should be preceded by very thorough antiseptic irrigation of the preputial sac. After both sides of the prepuce are slit, a large flap of foreskin projecting above and another hanging below will expose the entire glans for examination and treatment as soon as bleeding has ceased.

POLLUTIONS.—There is no symptom in connection with gonorrhœa that does less harm and creates more consternation than an emission of semen, especially in a patient whose mind has been misdirected by quack advertisements. It is often difficult to persuade such a patient into appreciation of the essential facts, viz.:

1. That in abstinence from sexual intercourse occasional emissions of semen from the overfilled seminal vesicles are perfectly normal.

2. That the local irritation of gonorrhœa is likely to evoke emissions more frequently than they would occur in health.

3. That no proximate or remote injury will come to the patient from such emissions, when they are not too frequent. Their frequency may vary widely within normal limits.

4. That only when the semen emitted is bloody, or when its emission gives pain enough to awake the patient, is it indicative of seminal vesiculitis and then requires attention.

If the patient's intellect is too limited to permit him to grasp these ideas, the physician is perfectly justified in employing such subterfuges as will best appeal to the patient's understanding. The one that succeeds most frequently is to felicitate the patient on the occurrence of these pollutions and to offer him remedies that will cause their continuance. The "remedies" then prescribed must naturally be only placebos.

At the same time, a towel tied around the waist and heavily knotted over the spine to prevent the patient sleeping on his back, and light evening meals, will contribute to reducing the frequency of pollutions.

PROSTATITIS.—Wossidlo¹ insists that no case of gonorrhœa be dismissed as cured before the physician has assured himself that the prostate is free from invasion. If this advice were always followed, there would be few, if any, cases of recurrent gonorrhœa.

The almost direct manner in which the prostatic ducts empty into the posterior urethra seems to invite infection from this region to the prostate, by continuity of surface. Bransford Lewis² supports his own studies of the frequency of infection of the posterior urethra, by the statistics of other authors, such as Letzel, who found posterior urethritis in 92.5 per cent. of gonorrhœas, Jadassohn in 87.7 per cent., Rona in 79.7 per cent. My own observations have led to the views expressed in the chapter on Acute Posterior Gonorrhœa.

Like posterior urethritis, gonorrhœal prostatitis may give but slight or practically no manifestations of its presence. It is therefore likely to be overlooked unless one makes it a rule to follow Wossidlo's sage advice.

A slight discomfort about the perineum and rectum may be the only indication of the disease. If this does not receive attention, pain referred more directly to the bladder may follow.

¹ Wossidlo: "Treatment of Chronic Prostatitis." Journal of the American Medical Association, August 27th, 1898.

² Lewis: "The Rôle of the Posterior Urethra in Chronic Urethritis." Read before the American Association of Genito-Urinary Surgeons, June 21st, 1893 (reprint from Medical Record).

The pain is accentuated by urination and defecation, especially when efforts are necessary to expel hard fæces. The patient is obliged to urinate frequently, but does not experience complete relief from the act. While the frequency may, in great degree, be caused by the coincident posterior urethritis, there is necessarily an amount of urine retained in the bladder. The quantity of residual urine is in proportion to the degree of prostatic engorgement. This pushes that part of the bladder which lies over the prostate upward into the vesical cavity. Behind this elevation a trough is produced, from which the bladder contractions do not suffice to force all the urine it contains above the hillock made by the enlargement. Sometimes the entire lower part of the enlarged prostate juts into the bladder cavity in such a manner as to form a species of valve. This is shown after such a patient has voided all the urine he can extrude by irrigating his bladder with a potassium permanganate solution. No difficulty opposes the inflowing solution, because it forces the prostate back toward its place. But when the patient voids all he can of the solution, it will be found decolorized by the retained urine if it is normal, or rendered brown, "muddy," in case the urine has become septic.

The prostate in this condition may cause "stammering" urination, as Guyon graphically describes it. The patient, by a series of contortions, invites the stream which, while he holds himself in a certain position, may flow freely; then suddenly an untoward motion throws the enlarged prostate against the internal meatus and urination stops. The greater the efforts made, the more firmly is the bladder outlet blocked. Only after successful efforts at relaxation does the prostate fall back and allow the urine to flow. But the bladder contractions may force the prostate up, and let it drop again, producing the characteristic stammering. The end of urination may be painful and accompanied by emission of pus and blood. When the conclusion of urination is so disturbed, neither the pain nor extrusion of pus and blood is as marked as in acute posterior urethritis. Naturally, if the prostatic trouble accompanies posterior urethritis in the fulminant form, the severe symptoms of the latter will overshadow those produced by the engorged prostate.

The frequency with which acute prostatitis complicates posterior urethritis is disputed. This may be due to the omission

of prostatic examination and to subsidence of its severer symptoms with the decrease of those of the urethritis.

On examining the prostate per rectum, the finger finds the gut hot, more or less firm and tender to the touch, according to the degree of inflammation. The anterior wall itself bulges downward and backward into the rectal space. The enlarged prostate, very tender to the touch, can be outlined through the rectal wall. These findings are the only ones by which prostatitis can be differentiated from posterior urethritis.

The rational division of this complication into simple acute prostatitis, acute follicular and parenchymatous prostatitis is sufficiently explanatory of the varieties. Their detailed con-

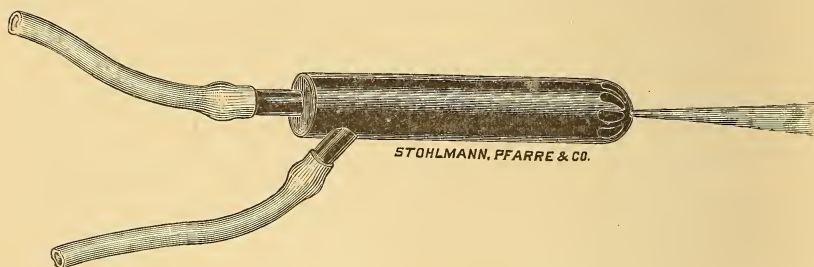


FIG. 33.—White and Martin's Rectal Injector.

sideration is unnecessary in a book limited to treatment, which does not materially differ in the several forms of the disease.

If the case is seen at the inception of the prostatic involvement, the patient must be put to bed, with a sewing-board or leaf of an extension table under that part of the mattress upon which his buttocks rest. Upon this a thick hair pillow is placed to elevate the pelvis. The intestinal discharges are kept soft by skimmed milk to the exclusion of other food, and the urine bland by alkaline diuretics. Irrigations of the urethra and bladder are as a rule exceedingly well borne during acute prostatitis, especially when the manifestations of posterior urethritis are marked.

If perineal pain and vesical tenesmus are severe, leeches to the perineum will furnish relief.

Rectal irrigations, hot or cold, according to the local and general condition, often give very prompt relief. The most convenient instrument for these irrigations is the rectal injector

described by White and Martin, who direct its use as follows: "A quart of a seven-tenths-per-cent. salt solution is heated from 110° to 115° F., and the injection pipe is introduced into the anus and its end tilted upward and forward so that the stream when it is turned on shall flow directly on the prostatic tumor as it bulges into the rectum. The exit pipe allows the fluid to flow away as fast as it enters the bowel. This treatment should be repeated two or three times a day."

When using this rectal irrigator, I found that larger quantities of hot water, two or even three quarts, gave more relief than one. After each rectal irrigation a suppository of

Iodoform. pulv., gr. ss.-iss.
Codein. phosph., gr. $\frac{1}{4}$ - $\frac{1}{3}$.
Ol. theobrom., q. s.

will aid in resolution, and further assuage pain.

Some patients bear cold irrigations much better than hot ones. In the beginning of prostatic involvement they occasionally act better; indeed, if used early enough, they often appear to abort the case.

Hot baths, and particularly hot sitz-baths, twice or three times daily, of ten to twenty minutes' duration each, will often give marked relief. In some cases a hot-water bag to the perineum aids in making the patient's condition tolerable.

Persistent severe pain and tenesmus, both vesical and rectal, may oblige recourse to opium administered by the rectum or morphine injected deeply into the perineum.

When prostatic enlargement prevents urination and the other means suggested for relief fail, or when the emergency of the case demands, recourse must be had to catheterization. As repetition of the use of the catheter will be required, and is painful, it will be well, when the urine is retained because of prostatitis, to employ permanent catheterization (see Retention).

If the prostate has become the site of pus formation, no time should be lost by any of the above procedures. Palpation through the rectum will reveal whether fluctuation points toward the bowel. If it does not, fairly moderate pressure may cause the pus to escape into the urethra; indeed, it is often so relieved by nature. In case this effort fail, it may be supplemented by the introduction of a Béniqué or Guyon sound, which

offers increased resistance, and performing massage while the sound is held in the bladder. But unless the physician has large experience in the use of genito-urinary instruments and is endowed with great delicacy of touch he should certainly avoid the use of these sounds, especially in acute inflammatory conditions.

If fluctuation does not distinctly point rectumward, and if nature or massage does not empty the pus into the urethra, a median perineal incision will be required for its evacuation and subsequent thorough drainage.

When, however, pus distinctly points to the rectum, it may be considered as nature's indication of the most favorable site for evacuation. Acting upon this suggestion, I have, in eight cases, opened prostatic abscess by a long incision through

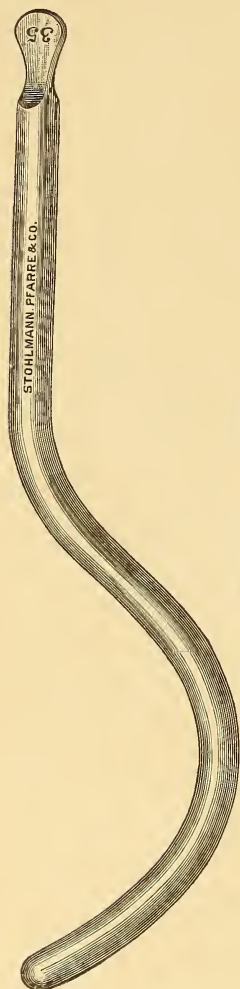


FIG. 34.—Béniqué Sound.

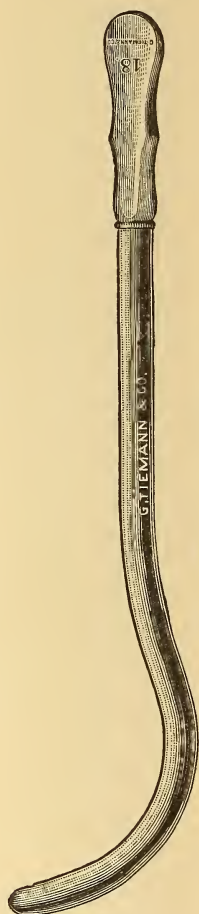


FIG. 35.—Guyon Sound.

the anterior rectal wall, packed the cavity with iodoform gauze, and have not observed one case of general infection. It is true that in each of these cases the rectum was on the point of breaking down when I operated.

In the above, termination of prostatitis by resolution or supuration only has been considered. Prostatitis may also go over into a chronic inflammation of the gland. Chronic prostatitis may also be a sequel to chronic posterior urethritis or cystitis, with no appreciable acute prostatitis preceding it. The gland being predisposed by congestion, it is easily susceptible to infection. Any disturbance producing pelvic engorgement, irritating injections, continued sexual excesses, masturbation, hemorrhoids, concentrated urine, habitual constipation, may produce congestion of the prostate.

The symptoms of chronic prostatitis differ but little from those of chronic posterior urethritis. The most marked difference is in a burning pain distinctly referred to a point almost immediately behind the fossa navicularis. Urination may be followed by and defecation associated with an emission of a milk-like fluid, which on examination is found to consist of prostatic juice, amyloid prostatic bodies, occasionally blood, epithelium from the prostate and its ducts, and pus. The pain after urination and defecation or either may be severe, lasting sometimes for several hours. It may radiate from deep in the perineum to the rectum, testicles, and down the thighs, and is aggravated by motion or effort of any kind.

The perineum is tender to touch. Rectal examination of the prostate shows it to be irregularly nodulated or asymmetric. After massage, the urine contains considerable pus.

The mind and nervous system suffer perhaps more in chronic prostatitis than in any other genito-urinary affection excepting seminal vesiculitis. These sufferings are aggravated when accompanied by reduction or loss of sexual desire. The patient then becomes markedly neurasthenic and even melancholic, with the usual accompaniment of general depressed physical tone.

The constitutional treatment of such cases demands regularity in meals, consisting of nutritious, bland, easily digestible food; systematic exercise, preferably walking in the open air, not, however, to the extent of tiring the patient, and a sufficiency of sleep.

Locally, rectal injections of a pint of hot water retained as long as possible and followed by a suppository of iodoform and codeine phosphate, twice or three times daily, will afford relief.

Hot sitz-baths twice or three times daily will also aid in the treatment.

Massage of the prostate every second day will empty the organ of pus that has accumulated, and will relieve congestion if it contains no pus. The most beneficial manner of securing this end is by a complete intravesical irrigation with boric acid, four per cent., followed by filling the bladder with the same solution, after its first washing has been passed out. The massage is performed after the bladder has been almost filled for the second time. The fluid then passed will be found turbid with the substances expressed from the prostate. If the patient can stand a third intravesical irrigation, one of silver nitrate 1:5,000 or 1:3,000, according to his vesical tolerance, may be advantageously used (see also Rectal Palpation of the Urethral Adnexa).

Patients with chronic prostatitis are liable to acute interurrences. These must be treated as suggested for acute prostatitis.

RETENTION OF URINE is rare in gonorrhœa. It may occur in very hyperacute cases, or in those aggravated by alcohol, coitus, masturbation, irritating injections, or the introduction of instruments. Invasion of the prostate and the presence of even large calibre strictures may produce retention of urine in gonorrhœa, by the urethrospasm they are likely to provoke.

When a patient with gonorrhœa cannot pass urine, he is usually in such agony that the history of the case cannot be obtained. It will be well, before attempting to unload the bladder, to examine the prostate. If the finger inserted into the rectum feels the prostate to be enlarged, hot and sensitive to touch, the retention is attributable to at least congestion of this gland. If the prostate be found normal, any or several of the above causes may be at the bottom of the retention.

The patient should be at once placed in a hot bath, hot enemata given him, followed by a suppository of iodoform and opium. If these fail to relieve the emergency, the following steps for evacuating the bladder may be employed:

1. Irrigate the anterior urethra with potassium permanganate 1:6,000 or boric acid four per cent. The solution should be at a temperature of between 110° and 120° F. This irrigation alone often suffices to relieve the spasm.

2. After using 750 c.c. (one and a half pints) of either of the above solutions, inject one or two drachms of a warm two-per-cent. solution of eucaine into the urethra. Hold it there by compressing the sides of the glans with the left thumb and index finger. Stroke the urethra with the right fingers at first gently, then with increasing pressure, to force the eucaine solution beyond the site of the spasm, which is usually located in the membranous portion.

3. Remove the nozzle from the irrigator tube and attach in its place a sterilized semi-soft French conical, well-lubricated catheter.

4. Insert the catheter, and when its eye is beyond the meatus let the irrigating fluid pass through it.

5. Very gently glide the catheter onward, striving to reach the bladder before the entire contents of the irrigator have escaped from the urethra. If the catheter in its onward course meets an obstacle which it cannot overcome without force, withdraw the instrument an eighth or a quarter of an inch and endeavor to insert it in slightly different directions until the lumen is found.

6. If the semi-soft catheter fails to enter the bladder, recourse must be had to a silver catheter, employing all the precautions mentioned above.

7. When the catheter has reached the bladder, detach the irrigator tube and allow about 90 c.c. (three ounces) of urine to escape slowly by checking the stream with the finger over the mouth of the catheter. When this amount has flowed off, inject 60 c.c. (two ounces) of four-per-cent. warm boric-acid solution. Again allow 90 c.c. to escape slowly from the bladder, and repeat the injection of 60 c.c. boric acid. Resume these alternate slow, small emissions and injections until the fluid that flows from the catheter proves to be clear boric-acid solution. Then inject 60 c.c. of boric-acid solution and withdraw the catheter until its eye is just beyond the compressor. This will be manifest by cessation of flow from its mouth.

8. Re-attach the irrigator nozzle and allow 250 c.c. (one-half pint) of warm boric-acid solution to run through the catheter while it is being removed from the urethra.

9. Urge the patient to retain the boric acid left in his bladder for at least an hour.

10. If three hours later the patient cannot empty his bladder without assistance, catheterize again as above directed.

The main purpose of the slowness advocated is threefold:

(a) The continuous flow of the warm solution through the catheter, while it is being passed through the urethra, is intended, as far as possible, to prevent carrying infection to the bladder. At the same time its temperature may aid in overcoming the urethral tumefaction and such spasm as may exist.

(b) Slowly emptying the bladder gives it better opportunity to regain its muscular tone, which may be seriously impaired by overdistention.

(c) Rapidly emptying the bladder to relieve retention may be followed by dangerous hemorrhage *ex vacuo*.

In some very rare cases, great difficulty may be experienced in inserting a catheter, when a second emptying of the bladder becomes necessary. The question of permanent catheterism then arises. It naturally involves the risk of impeding the free escape of pus from the urethra and of infecting the bladder. Equally its omission may allow the congestion of the urethra or of the prostate or both to increase, effectually shutting off the outflow of urine, with all its dangers.

In such a rare case it is advisable to provide continuous bladder drainage, with a catheter too small to block the urethral discharge. The presence of the catheter in the urethra and bladder will serve to reduce the thickening of the urethra and of the prostate, if both are congested, as is shown by the free voluntary outflow of urine alongside the catheter in a very few hours. Repetition of catheterization will then not become necessary.

The easiest and safest method of fastening the catheter in the bladder is the one we owe to Guyon,¹ whose directions are condensed as follows:

1. Cut two pieces of firm knitting yarn each one metre (about forty inches) long.
2. Fold them in half, and tie the free ends of each separately.
3. Place the strings in bichloride or boric-acid solution.
4. Insert the catheter and so place it that the urine comes

¹ Guyon: *Leçons cliniques sur les Maladies des Voies Urinaires*, vol. iii., Baillière, Paris, 1897.

from its mouth in single drops. Watch this dropping for several minutes; if the urine is occasionally emitted in a little stream, or if it stops entirely, move the catheter either a trifle more deeply into the bladder or an equal distance forward until permanent dropping of urine is secured.

5. Take one of the doubled strings from the antiseptic solution, fold it in half again, and tie it firmly around the catheter, exactly at the level of the meatus (A) (Fig. 36). Then take its two double ends to the side of the penis, hold them together at the coronary sulcus (B') and tie another knot there. Keep this knot at the sulcus (B) exactly half-way between the frenum and the dorsum of the penis. Separate the doubled strings and pass them around the penis, to be tied in a firm knot at the corresponding side (B'). The double string collar thus tied about the neck of the penis must not be tight enough to cause even inconvenience should an erection occur.

6. Tie the second doubled string (which appears as dotted line in Fig. 36) in the same manner as the first doubled string was attached to the catheter. Place the first knot in the second doubled string immediately in front of the first string and directly opposite the first knot. Carry both ends of the second string to the knot that completed the collar (B'). Tie a knot in the second string there. Separate the cords that form the first string as it makes the collar at each side of the knot and pass each end of the second string through the separations. Tie them in a knot upon the first string's knot (B'). Pass the two ends of the second string around the neck of the penis as those of the first string were passed, but in the opposite direction, forming another collar. Close the collar by a knot at B and

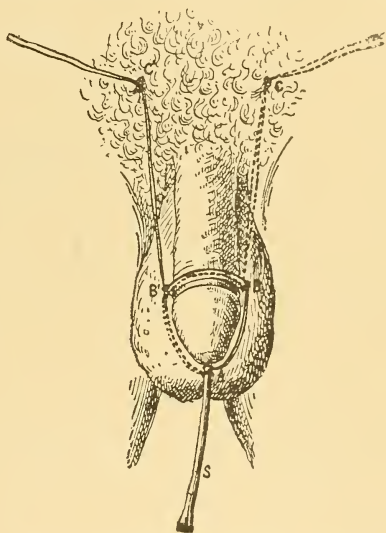


FIG. 36.—Fastening Catheter into Bladder.
(Guyon : "Voies Urinaires.")

fasten the strings there in the same manner as they were fastened at B'.

7. Take up a bunch of hair at about an inch from the root of the penis (C) and twist it into the shape of a moustache. Lay the string alongside of the penis like a rein, and where it touches the moustache, without stretching or moving the penis from the exact median line; tie it firmly about the root of the moustache. As this knot will envelop the base of a pyramid of hair, it will be likely to slip off; therefore double the moustache upon itself and with another knot fix the rein in place.

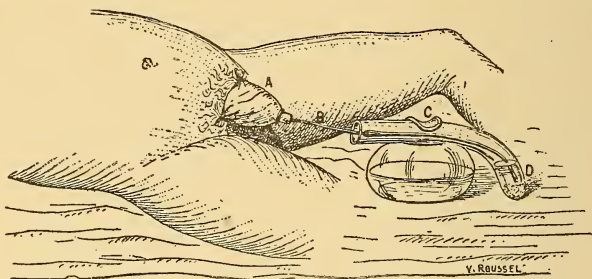


FIG. 37.—Drainage into Urinal.
(Guyon: "Voies Urinaires.")

Repeat this procedure with the other rein that hangs from the collar at B', attaching it to C', opposite the first moustache.

After so fastening the catheter in place, the condition of the bladder must decide whether continued drainage or interrupted evacuation should be employed. In a general way it may be laid down that if the bladder is infected, continued drainage with continual washing will be necessary; if the bladder is not infected, interrupted evacuation is easily obtained by plugging the mouth of the catheter with a wooden spigot. This spigot can be removed each time it becomes necessary to empty the bladder.

Continuous drainage of the bladder is best accomplished by attaching a rubber tube eight inches long to the mouth of the catheter, and inserting it into the bottom of the tube (D) of a Duchastelet antiseptic urinal, containing a solution of bichloride 1:1,000. A similar quantity of the same solution may be poured into the bowl of the urinal, through its opening C, after the urinal is placed between the patient's thighs. The purpose of placing the urinal between the patient thighs is to protect the

bed, to allow the patient some latitude in motion and to prevent the bending of the penis and the catheter it contains, thus insuring its continuous free action.

Whether it is determined to employ continuous or interrupted vesical evacuation, the penis should be "dressed" in the manner laid down by Guyon. This dressing is made with three pieces of salicylated or carbolated gauze 25 cm. (about ten inches) square. These are folded in half, from one angle to its opposite one, making a triangle of six layers of gauze. The base of this triangle is passed close to the penoscrotal angle, and the two angles at the base are doubled over the penis so that the one projecting to the right of the penis reaches the left side of the pubis, where the strings holding the catheter are tied to the hairs (see Fig. 37). It is firmly attached to this spot with the string that was left hanging there. The angle of the gauze triangle projecting from the left side of the penis is folded over to the right tied moustache and attached firmly to it. The moustache strings are then cut off. The penis is thus completely enveloped by the gauze. To prevent its slipping upward, the angle around the catheter is tied to it by another piece of string.

While it is undoubtedly a grave violation of surgical principles to insert any instrument into an acutely inflamed urethra, I must confess that I was driven to it in three cases. In each of these the urethra was lacerated from attempts to pass catheters for the relief of retention. No aspirator or trocar was within several hours' reach, and the patients were in acute suffering, with high fever. I was fortunate enough to get catheters into these bladders. One remained four hours, another six hours, and the third eighteen hours. Naturally all possible antiseptic precautions were taken. In none of the three cases did vesical infection result, nor was the gonorrhœa materially aggravated from the use of the catheter.

Should it be impossible to pass a catheter, after the preliminary efforts (hot baths, etc.) have failed, it will be necessary to either aspirate or evacuate part of the bladder contents by a trocar through the suprapubic space. In many cases it will be found that after removal of perhaps one-fifth of the retained urine, the patient will be able to empty the remainder through the urethra, owing to relief from the tension.

If prostatic congestion causes the retention, catheters of the Mercier curve will be found most useful. Guyon suggested various lengths of beaks and angles at which the beaks are attached to the shafts for easier introduction and more comfortable retention, according to the degree of prostatic swelling. Those most frequently used are shown in Fig. 38. Their pressure upon the prostate proves valuable, while placing the retention of urine under control. When, however, evidence of pus

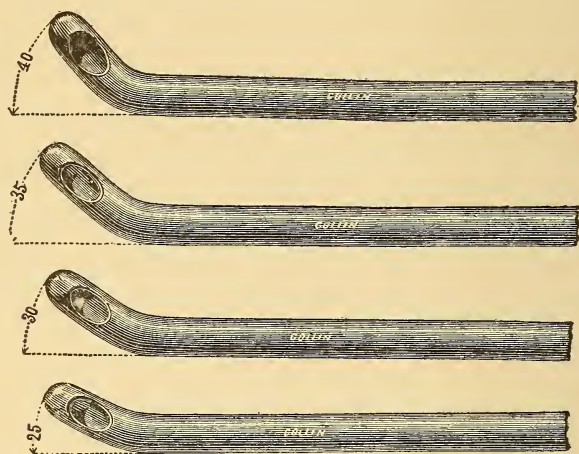


FIG. 38.—Guyon Beaks of Mercier Catheters.

formation in the prostate presents, the abscess cavity must be promptly emptied.

RHEUMATISM (gonorrhoeal).—A somewhat extensive study of the literature of gonorrhoea makes Bransford Lewis appear the first, at least among American writers, to show that infection of the posterior urethra is far more frequent than is ordinarily assumed. This author,¹ in an interesting and instructive monograph, shows that posterior urethritis is almost invariably present in every case of prolonged or severe gonorrhoea. He further asserts that the gonococci, instead of gradually progressing along

¹ Lewis: "The Rôle of Posterior Urethra in Chronic Urethritis." Read before the American Association of Genito-Urinary Surgeons, June 21st, 1893, Medical Record.

the urethral mucosa to penetrate eventually the compressor in two or more weeks after the onset of the disease, are promptly carried back through the lymphatics. About the same time Rona, of Budapest, made similar assertions, but his thoughts on the subject were presented more tentatively than were the findings of Lewis.

The facts exposed by these authors emphasize the need of intravesical irrigations (see page 29) even when gonorrhœa seems to affect only the anterior urethra. At all events, experience shows that when irrigations are properly used, the posterior urethra, if it does not escape invasion, does not show any manifestations of the disease.

Accepting the above author's most reasonable explanation of the etiology of posterior gonorrhœa, it is not surprising that remote regions and organs are often the site of the deposit of gonococci. As mentioned elsewhere, there is hardly a soft tissue of the organism in which modern investigation has not been able to demonstrate gonorrhœal infection.

Among the manifestations of remote gonorrhœal invasion, rheumatism is at present the most frequently recognized. In the majority of cases it affects only one joint, and among these oftenest the knee. Less frequently the ankle, wrist, and elbow are the site of gonorrhœal rheumatism.

Gonorrhœal rheumatism is not distinguishable from rheumatism of other origin. Neither does its appearance, while a patient has gonorrhœa of the urethra, conjunctiva, vagina, or rectum, prove that it is gonorrhœal. The fever and sweating are usually higher in ordinary rheumatism, except when the affected joint becomes the site of pus formation.

When rheumatism of any kind complicates gonorrhœa it should be treated as rheumatisms usually are. While this is being done, irrigations must not be interrupted, so that the gonococci, which may be the provokers of the rheumatism, be eliminated as soon as possible.

SKIN DISEASES.—Taylor says that he has many times seen patients with acute and declining gonorrhœa attacked by eruptions resembling scarlatina, measles, cedematous erythema, and urticaria. In some instances he did not find that gastric disturbances due to antiblennorrhagics was the exciting cause.

Many other eminent writers have reported such cases.

Among these Finger¹ described three of gonorrhœa and cystitis complicated by purpura rheumatica.

Buschke,² grouping his own observations and those of other writers, "first mentions simple erythema, which usually appears in connection with gonorrhœal rheumatism, epididymitis, or other localized inflammatory complication. Cases have been recorded, however, of a febrile erythematous rash in gonorrhœa.

The second group is made up of urticaria and erythema nodosum. The fact that the latter form of eruption may complicate a febrile gonorrhœa shows that it is not a mere appanage of polyarthritis, but is most likely due to the direct action of the gonococcus.

The third division of Buschke is made up of hemorrhagic and bullous eruptions.

The fourth and last division consists of the hyperkeratoses, and has hardly before been mentioned in literature. Buschke has found a record of four cases which he considers in this connection. In a case originally described by Chauffard, for example, there were horny thickenings upon the feet, back, penis, and insides of thighs, accompanying a general gonorrhœal intoxication.

Authorities are still at odds as to the explanation of these cutaneous manifestations of gonorrhœa, and several widely differing views are ably maintained in controversy."

My own studies of skin complications of gonorrhœa began after I had commenced the use of irrigations. None of the cases so treated from the inception had any dermal trouble. Many of those which had been treated before by internal medication or hand injections or both, had skin diseases. In those in which the skin affections could not be traced to digestive disturbances from antiblennorrhagics, they appeared to have no connection with gonorrhœal infection, except in some of those conditions mentioned under neuroses.

STRICTURE.—Wossidlo³ defines urethral stricture as "a nar-

¹ Finger: "Ueber Purpura rheumatica als Komplikation blennorrhagischer Prozesse." Wiener medicinische Presse, Nos. 9, 10, and 11, 1880.

² Buschke: Archiv für Dermatologie und Syphilis, Band xlvi., No. 2, most admirably excerpted by the Medical Review of Reviews, July 25th, 1899.

³ Wossidlo: Die Stricturen der Harnröhre und ihre Behandlung, Naumann, Leipzig, 1898.

rowing of the urethral lumen and reduction of its normal dilatability, produced by organic changes in the urethral walls."

Such changes are usually brought about by a gonorrhœa allowed to go on to chronicity through lack of proper treatment or care. Congenital strictures, however, and those provoked by traumatisms (such as the passage of a rough stone) may complicate gonorrhœa as seriously as can acquired strictures. They can, moreover, by the same cicatricial tendency to contraction, produce all the disastrous results that may follow the latter. Infantile lithiasis, evidenced by painful urination and purulent discharge, containing no gonococci and afterward forgotten, may often be the cause of presumed congenital stricture.

When stricture from internal or external causes complicates gonorrhœa, the disease will persist ordinarily until the stricture is cured. Stricture itself is too vast a subject to be even outlined in a small effort like this; its influence on gonorrhœa, which is prone to aggravate a pre-existent stricture and to produce new coarctations, is daily evident.

The presence of stricture in no wise modifies the treatment of gonorrhœa by irrigations. When the acute manifestations of gonorrhœa have yielded, the stricture or strictures must receive attention, as will be sketched under the head of Chronic Gonorrhœa.

TRAUMATISMS OF THE URETHRA.—The injuries of the urethra that may complicate gonorrhœa are, besides those mentioned under Foreign Bodies and Hæmaturia, such as may be produced by faulty circumcision.

M. A. Wasiliew,¹ citing Bergson, Ploss, and Joly, shows that this operation was performed by the ancient Egyptians and Phœnicians. To-day ritual circumcision is done only by Jews, Mohammedans, and a number of savage tribes.

The American and Russian Jews cut off the preputial integument with a small knife, and tear the mucous fold with the fingers. The knife may injure the glans and the part of the urethra it contains; efforts to split a firmly adherent mucosa with the pulp of the index fingers and thumb nails may tear open the fossa.

¹ Wasiliew: Die Traumen der männlichen Harnröhre, Hirschwald, Berlin, 1899.

In Germany and Hungary, so I am informed, many ritual circumcisers maintain the right thumb nail long and trimmed for the operation; others use a silver ring-shaped attachment with a flat, finger-nail-like projection, to slip over the thumb when the operation is to be performed.

At least one of the native tribes, Los Lacantunes, of that region of Guatemala that has been but partly explored, use an obsidian for the same purpose.

Ramón Guiteras¹ is of the opinion that stricture of the meatus is most frequent with those circumcised in infancy. Since having attention called to this point, I searched my records and found that I performed far more meatotomies on those circumcised in early life than on others. If this is not a mere coincidence, it is hardly explicable by nature contracting the meatus to protect the urethra. It seems more likely to be attributable to the crude methods employed by the Mohelim or Mauhelim (ritualistic circumcisers).

Every physician who has circumcised many infants knows that the lips of the meatus are found pouting. As the ritualistic circumcisers cut or pinch off the foreskin close to the meatus, it is readily appreciable how they can remove with it a part of the pouting lips. The resulting cicatrix naturally contracts and so produces the stricture. Among those who present no contraction of the meatus, slight radiating marks suggest the possibility of a small tip of the meatus having been removed.

Disregard for asepsis in ritualistic circumcision has caused many, and among them devout Jews, to inveigh against the operation. Erysipelas, syphilis, and tuberculosis are frequently reported in support of this objection. In France a sanitary law was passed at the beginning of 1899 prohibiting circumcision, except it be in the presence of a physician. While the intent of this law is manifest, its execution is likely to fall far short of its purpose, as must be evident to those who from sad experience know the difficulty of securing asepsis in even trained assistants and nurses.

Regarding injuries to the urethra from circumcision, Sascke²

¹ Guiteras: "A Review of the Principal Features of Urethral Stricture." Medical Review of Reviews, January 25th, 1899.

² Sascke: "Beträchtliche Verletzung der Harnröhre." Schmidt's Jahrbücher, vol. lv., 1847.

reports a young Jew whose anterior half of the glans was missing. The meatus was at the lower surface, and behind this a second orifice emitted the urine. It seems, however, that in this case the mutilation complicated a pre-existing deformity.

A patient referred to me for chronic gonorrhœa had had over four-fifths of the right half of his glans torn off during ritualistic circumcision. The left side of the fossa was exposed. From the right coronary margin three fleshy projections hung. The consequence of this deformity doubtless contributed in making his gonorrhœa most persistent.

A most aggravated case of urethral traumatism from external violence was in a young man whose penis a prostitute had bitten while, as he said, both were drunk. Singularly enough, the upper surface of the middle third of the penis showed only slight bruises from the teeth; the lower central incisors had evidently been sharper, for they penetrated the urethra and had sunk into the corpora cavernosa. Permanent catheterization was at once employed, but as the wound soon manifested syphilitic infection attempts at repair have thus far proved futile.

Injuries to the urethra from within, such as follow violent instrumentation, false passages, tears of the mucosa, may complicate gonorrhœa. When irrigations have reduced the inflammation and discharge to a minimum, these injuries should be sought by the urethroscope and treated as their especial character may require.

VESICULITIS SEMINALIS (Gonocystitis).—If Fuller¹ had done nothing else than develop the pathology and rational treatment of inflammation of the seminal vesicles, his studies of this disease alone would suffice to place the profession under deep obligations to him.

With a view to refreshing memory on the precise location of these organs, whose infection is far more frequent than ordinarily recognized, a schematic drawing may be borrowed from Stewart,² elucidated with Lewis'³ concise description of the seminal vesicles which is here condensed: The vasa deferentia

¹ Fuller: Disorders of the Male Sexual Organs, Lea, Philadelphia, 1896.

² Stewart: Diseases of the Urethra. William Wood & Company.

³ Lewis: "Seminal Vesiculitis as an Obscure and Elusive Disease." Medical Age, June 25th, 1897.

carry the spermatozoa from the testicles, through the inguinal canals, into the pelvic cavity, converging behind the bladder and almost touching each other behind the prostate. The seminal vesicles lie against the posterior surface of the bladder, just beyond the convergence of the vasa, which conduct the spermatozoa into the vesicles. There the fluid secretion of the vasa keeps them alive. At opportune moments (coitus or nocturnal emission) the spermatozoa are thrown out of the vesicles through the ejaculatory duct, which perforates the prostate, into the pos-

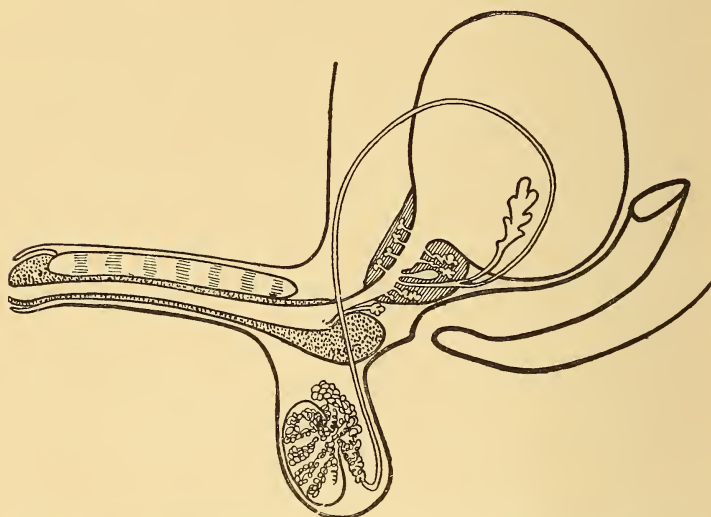


FIG. 39.—Location of the Seminal Vesicles (from Stewart's "Diseases of the Urethra").

terior urethra, where they are mixed with prostatic juice, and whence they are ejected by the spasmodic contractions of ejaculation.

It consequently is clear that the finger inserted into the rectum will feel the seminal vesicles immediately above the prostate and projecting to either side of the bladder. In health, however, these soft little pouches are difficult and often impossible to find.

In view of the fact that the ejaculatory duct is so short and almost straight, it is strange that seminal vesiculitis does not more frequently complicate gonorrhœa. As, however, acute gonocystitis, as Gouley aptly calls the disease, fortunately tends to resolution, it may be overlooked in very many gonorrhœas.

Moreover, the close resemblance of its symptoms to those of posterior urethritis and prostatitis may account for its relatively rare discovery. If every patient with gonorrhœa were subjected to digital examination per rectum, infection of the seminal vesicles would be better understood and its often disastrous consequences avoided.

The symptoms may be ushered in by a mere sense of weight in or about the perineum. This soon changes to dull or throbbing pain in this region and that within the anus and the bladder. Rectal and vesical tenesmus may become very intense. All these symptoms increase while urine accumulates in the bladder; the pain then may be referred to the region of the glans or the root of the penis, or both. The constitutional disturbance is often quite marked; anorexia, even nausea, may accompany the beginning of the disease, while decided chills and fever may cause an error of diagnosis.

Certainty of differentiation, principally from posterior urethritis, is obtainable only by rectal examination. The presence of a swollen, painful prostate should not be accepted as concluding a diagnosis. The finger passed beyond this gland should seek the seminal vesicles which, if involved, will be found "much enlarged in all directions in the shape of a distended leech, hot, brawny, and exquisitely tender" (Taylor).

Further development of the disease can cause a pulpy confluence of the vesicles of both sides, rendering their delineation impossible. They may then appear as if overhanging the prostate like a large, flabby mass.

With the progress of vesiculitis the patient presents all the appearances of severe illness associated with acute sufferings. The pains in the perineum, rectum, and bladder become intensified, and extend to the sacrum, the coccyx, the hip-joint, down the sciatic nerve, sometimes up to the diaphragm, making even breathing painful. The local pains are increased by urination, which is frequent; but the pain, if there is any after urination, is not so severe nor so prolonged as that of posterior urethritis.

Examination of the urine may be misleading, unless specimens of the first morning urine or that passed at the end of defecation is used. At other times the urine may appear normal. The properly selected specimen will contain, according to the

intensity of the involvement, pus corpuscles, red blood corpuscles, epithelia from the ejaculatory ducts, epithelia from the prostate, mucous casts, and spermatozoa. Among the latter many a one will be found with a rounded enlarged head whose pellucidity has changed to a granular appearance, making the diseased spermatozoon look like a tailed pus corpuscle. If the gonocystitis is gonorrhœal, gonococci will be present in the specimen. The greater the chronicity of the case, the greater will be the number of the fat globules. Fuller (*op. cit.*) holds that in about one-third of the cases of seminal vesiculitis the disease is tuberculous. While all deference is due to Fuller's wide researches, this large number of tuberculous invasions of the seminal vesicles does not coincide with the experience of others, that of the present writer included. Still, Fuller's warning should never be left out of mind.

Heitzmann (*op. cit.*) always finds prostatic epithelia with microscopic evidences of gonocystitis, from which he deduces that the prostate is inflamed when the seminal vesicles are. For self-evident reasons (see Fig. 39, page 120) it would be practically impossible for the prostate to escape such infection. But as the disease of the vesicles may overshadow the latter, it may elude observation.

Defecation, in seminal vesiculitis, is often as painful as is urination. It may be associated with intense tenesmus of the rectum and of the bladder.

Unless sleep is disturbed by painful erections or emissions, it may be very prolonged. Despite its length, the patient is as fatigued when he awakes as when he retired.

If the patient has nocturnal emissions, they may be bloody or of a chocolate color, from the admixture of blood.

When the ejaculatory duct is not firmly agglutinated, the seminal vesicle may be emptied of much or all of its pus by strippings through the rectum. The remainder of the treatment is necessarily similar to that advised for prostatitis.

If acute vesiculitis does not go on to resolution or is not relieved by treatment, it may go over into chronic gonocystitis or abscess may form, with all the dangers of invasion of other structures.

Abscess of the seminal vesicles should be promptly emptied through the perineum or the rectum. In making the long free

incision through the anterior rectal wall for extensive abscess, as advised by Gouley, the cavity should be carefully packed and asepsis of the region observed as cautiously as possible.

An attempt to study chronic seminal vesiculitis in such brief form as would be admissible here could not but prove misleading. The reader is therefore referred to the more exhaustive works of Fuller, Gouley, Taylor, White and Martin, and others for clear, complete discussion of the subject.

This perfunctory disposal of chronic seminal vesiculitis should not lead to a light consideration of the disease. The vast array of symptoms, direct and reflex, which it produces makes it worthy of most serious attention, as do the dangers to which it exposes the patient. Moreover, when due to gonorrhœa, as it very often is, it will explain many cases of apparently frequent recurrences of the disease. Indeed, when a presumably fresh gonorrhœa presents in less than two or more than ten days after coitus, the physician would be derelict in his duty if he did not interrogate the seminal vesicles.

URETHRO-PROSTATIC INFECTION BY THE NOGUÉS-WASSERMANN DIPLOCOCCUS.—While this form of genito-urinary infection is not a complication of gonorrhœa, it is outlined here for convenience of differentiation. This urethro-prostatic trouble may be mistaken for cystitis, urethro-cystitis, and prostatitis. Paul Nogués and Melville Wassermann¹ describe the etiological microbe which they discovered as resembling the gonococcus in form, dimensions, staining and decolorization by Gram's method so closely that many authors would not hesitate to class it with Lustgarten and Mannaberg's pseudo-gonococci. They insist that all the diplococci so grouped can be differentiated by careful examination.

Nogués and Wassermann describe the symptoms of urethro-prostatic infection by their micro-organism in a case from Guyon's service in the Hôpital Necker:

The patient, aged 42, had no disease except syphilis, contracted many years ago. Eighteen months before being treated at the Necker, he had had vague pains in the region of the perineum and of the anus. Twelve days subsequently he observed

¹ Nogués et Wassermann: "Infection Uréthro-Prostatique, due à un micro-organisme particulier." *Annales des Maladies des Organes Génito-Urinaires*, July, 1899.

an oozing from the urethra. This oozing never assumed the proportions of a true blennorrhœa, he had no painful urination nor nocturnal erections. The only functional symptom was the anal pain mentioned above. For six months he was treated by washings with boric acid and santal oil internally. The next physician he consulted diagnosed prostatitis and employed irrigations of potassic permanganate and prostatic massage. No change in the condition resulted in the beginning; soon, however, vesical manifestations appeared—the patient urinated every two hours during the day and four times at night. In this condition he sought Professor Guyon's advice. The urethral discharge was then minimal, but a few slightly colored spots stained the shirt; the urine was acid and clear, but the first urine emitted contained numerous dense and heavy filaments. The urethra was found in good condition, the bladder of nearly normal capacity. The prostate was in almost complete health, but the urine voided immediately after massage was decidedly turbid. In this specimen Nogués and Wassermann found their microbe.

After an instillation of silver nitrate into the prostatic portion by Guyon's method, the urine almost recovered its transparency; very careful microscopic examination did not reveal any bacteria whatever, and two tubes of agar and of bouillon sown with the specimen remained sterile. The cure was verified two weeks later by a second bacteriological examination which gave a negative result.

The authors, after most exhaustive histological and bacteriological series of experiments, including cultures on all accepted media of the turbid urine with an abundant whitish sediment, sum up the characteristics of their microbe as follows:

A diplococcus, within and outside the leucocytes, not in specific grouping, readily decolorizable by Gram's method; easily and abundantly culturable on all the ordinary media except on potato; does not liquefy gelatin, indifferent in the presence of oxygen and of rapid growth in anaerobic condition; apparently with no power to decompose urea.

They conclude that the diplococcus they describe is the infectious agent of a form of urethro-prostatitis and that it can be thoroughly differentiated from the gonococcus by culture.

VIII. CHRONIC GONORRHŒA.

Under the treatment pursued before irrigations were established, six weeks was deemed the duration of an acute gonorrhœa. If it proceeded beyond six weeks, it was considered to have gone over into a chronic condition. This chronicity, however, was often associated with all the symptoms of the acute attack.

Goldberg's statistics (quoted on page 1) compiled from the works of all who wrote on irrigations, whether approvingly or disapprovingly, show that ninety per cent. of the patients recover within fourteen days. It is therefore equally proper to hold that a case of gonorrhœa not entirely cured within two weeks must be considered a chronic clap.

Janet, to whom all the credit is due for popularizing the irrigation treatment, advises a second series of irrigations after the first series, when that has not succeeded. The second series of irrigations with solutions of potassic permanganate as advocated by Janet is as follows:

First day, first visit,	Anterior irrigation.....	1:3,000
First day, 7 P.M.	Anterior irrigation.....	1:6,000
Second day, 9 A.M.	Intravesical irrigation.....	1:4,000
Second day, 7 P.M.	Anterior irrigation.....	1:4,000
Third day, 7 P.M.	Anterior irrigation.....	1:2,000
Fourth day, 9 A.M.	Intravesical irrigation.....	1:3,000
Fourth day, 7 P.M.	Anterior irrigation.....	1:2,000
Fifth day, 7 P.M.	{ Intravesical irrigation.....	1:3,000
	{ Anterior irrigation.....	1:1,000
Sixth day, 7 P.M.	Anterior irrigation.....	1:1,000
Seventh day, 7 P.M.	Anterior irrigation.....	1:1,000
Eighth day, 7 P.M.	{ Intravesical irrigation.....	1:3,000
	{ Anterior irrigation.....	1:1,000

In offering the above formulary, no thought is conveyed that it will cure every chronic gonorrhœa. Even if the clap is uncomplicated, the solutions may have to be materially modified to meet the individual peculiarities of each case. The solutions advised, however, meet the average cases.

Furthermore, this formulary will serve admirably in most gonorrhœas which appear without acute manifestations (*chroniques d'emblée*, Guiard) and which are so often erroneously called "light attacks."

The majority of cases, however, require most scrupulous search for the conditions that cause their progression into chronicity.

In an effort like this none but the barest outlines of pathology can be sketched, and indeed, none of these can find place except those essential to an intelligent comprehension of the treatment advocated. The writers who have labored and are laboring so industriously and well in this, the most important department, of genito-urinary diseases, can receive but scant attention. No lack of appreciation is conveyed thereby. As Oberlaender¹ said five years ago: "The literature of chronic urethritis has grown to monstrous proportions." The additions to this literature since then are if anything greater in number than those which preceded Oberlaender's comment; hence the hopelessness of attempting even approximate justice to the authors.

The principal conditions that predispose a patient to the establishment of a chronic gonorrhœa are reduced vital resistance, lax urethral mucosa, phthisis, diabetes, phimosis, agglutination of the prepuce to the glans, tight meatus, a narrow urethra, deformities of the glans, para-urethral fistulæ and residual defects from former gonorrhœas, "be they ever so minute and often not evident to the inexperienced urethroscopist" (Oberlaender). In many instances none of these predisposing elements are found to explain the progress into chronicity; in any given case in which this occurs, cure is not likely to be obtained until the cause is found and removed.

The causes of the transition of gonorrhœa into the chronic state, are summed up by Guiard² in his brilliant and exhaustive work on the subject. With slight modification from this author, they may be cited as: (1) congenital or acquired deformities; (2) the patient's constitutional condition; (3) misdirected or insufficient initial treatment; (4) infractions of hygienic precautions; (5) over-treatment.

The two first-named have been briefly mentioned above. They are discussed somewhat more in detail in Chapter VII. (Complications of Gonorrhœa).

¹ Oberlaender: "Die chronischen Erkrankungen der männlichen Harnröhre." Klinisches Handbuch der Harn- und Sexualorgane, vol. iii., Vogel, Leipzig, 1894.

² Guiard: *Les uréthrites chroniques chez l'homme*, 1898, Rueff, Paris.

As outlined under the head of acute gonorrhœa, irrigations to be effective, must be promptly and energetically instituted as soon as possible after inception of the disease. But irrigations will certainly be misdirected and thwart the object in view if the physician were to mistake force and violence for promptness and energy. The column of fluid, if brusklly sent into an exquisitely inflamed urethra, cannot but damage it; lesions can easily be caused thereby, directly inviting invasion of the deeper structures and thence of the adnexa and the entire organism. Therefore, while all uncomplicated and most complicated gonorrhœas must and should be treated by the general practitioner, none should touch them save those who are characterized by innate and carefully cultivated delicacy of manipulation. Only those so endowed are able to avoid misdirecting even the best intended efforts.

Insufficient initial treatment is likely to obtain in the hands of physicians whose delicacy of touch is above criticism, but who lack adequate firmness of purpose. While these will not sin by injuring the inflamed urethra they, through timorousness, are prone to allow the disease to gain mastery over the infected region. This extreme is quite as reprehensible as the other.

An exceedingly frequent element for the production of chronic gonorrhœa, entirely beyond the physician's responsibility, is in the hygienic and dietary infractions which patients commit. In Chapter VI. (Constitutional and Accessory Treatment) an endeavor is made to outline the hygienic and dietary precautions that are necessary for the successful treatment of gonorrhœa. If the physician, for any reason, cannot obtain such control over his patient that the latter will follow these simple instructions or appreciate the dangers of their infraction, he will wisely recommend to him the study of James Foster Scott's¹ book. Should the patient's inferior intelligence or lack of application not permit him to grasp the value of Scott's excellent work, he may be advised to read a small effort in the same direction. Its author² will not object if his name is erased from the article before it is handed to the patient.

¹ Scott: *The Sexual Instinct; Its Use and Dangers as Affecting Heredity and Morals*, Treat, New York, 1899.

² "Advice to Gonorrhœal Patients." *Philadelphia Medical Journal*, July 8th, 1899.

Excessive treatment cannot only assure a gonorrhœa becoming chronic, but also tends to perpetuate a chronic clap indefinitely. In Chapter XIV. (The Proofs of Cure of Gonorrhœa) the indications for discontinuance of treatment are detailed.

The local pathological conditions which maintain a chronic gonorrhœa have been and are made the objects of special investigations by an immense array of learned men. To even quote their names and outline their results would require a large volume.

For the general practitioner's purpose it may suffice to begin the study of chronic gonorrhœa by attaching its cause to: (1) epithelial disturbance; (2) infiltration of the mucosa; (3) involvement of the urethral glands; (4) infection of the adnexa.

While precise distinction of the three first-mentioned conditions is obtainable only by the urethroscope, it can hardly be expected that any but those with a very large general practice will avail themselves of this instrument of precision. Those who desire to instruct themselves in urethroscopy will find elementary outlines thereof in Chapter XIII. (Urethroscopy).

A study of the symptoms of chronic gonorrhœa is, however, open to even the least experienced. An effort will be made to depict those that are most directly related to therapeutic suggestions. For easy reference they are arranged in alphabetical order. Necessarily, with a view to differentiation, this list must include some symptoms not due to chronic gonorrhœa.

ABSENCE OF SYMPTOMS—see Chapter XIV. (Proofs of Cure of Gonorrhœa).

APPARENT ASPERMIA.—Quite a number of patients complain, long after external evidences of gonorrhœa have passed off, that they experience little or no sensation at the conclusion of the sexual act, no matter how prolonged it was. When withdrawing the penis at the feeble conclusion of the act, nothing is seen to escape from the meatus. Manifestly, unless the case be one of true aspermia, swelling of the posterior urethra directs the semen into the bladder, instead as normally, through the compressor. The next urination then carries with it the semen that should have been forcibly ejected in coitus.

Some of these patients, who are called "trompeurs" (cheaters) in French literature, will confess to having employed artifices to prolong the sexual act or to prevent pregnancy. These

artifices embrace digital compression of the urethra, constriction at the peno-scrotal juncture by a rubber band, or a species of mental coercion by means of which the orgasm is arrested just before ejaculation. The first urine passed after such coitus will be found to contain an abundance of semen.

DEFECATION AND URINATION DROP.—Very many patients have no discharge whatever, but during or after defecation or after urination a thick white drop appears at the meatus. The manner in which this drop appears at once suggests a urination—or defecation—spermatorrhœa. Indeed, these may coexist with the manifestation which I have named as above.

Like urination—or defecation—spermatorrhœa, this drop is sometimes attributed to expression of a diseased prostate or posterior urethra, by the pressure of lumps of hard fæces upon these organs in their passage through the lower rectum. The anatomical relations of this region prevent a fæcal bolus, which can at all pass the anus, from exercising sufficient pressure upon the prostate or posterior urethra to expel their secretions. The fæcal mass, however, if hard, stimulates voluntary contractions of the rectal and urethral detrusors, and these, by forcible compression of the prostate and posterior urethra, cause them to yield some of their contents.

Macroscopically, these drops differ from those of spermatorrhœa in not proving tenuous—*i.e.*, they cannot be drawn out in such long filaments. Moreover, they dry in concretions resembling phosphatic calculi. When fresh, and pressed or rubbed between two cover-glasses they convey a sensation as if they contained very fine sand.

Microscopically, these drops show pus in minute quantity, much mucus, epithelium, and occasionally gonococci. The grit-like substance has the appearance of little globules, resembling cocci. If acetic or nitric acid is added to them, they dissolve with the escape of bubbles of gas.

If spermatozoa are found, the case may be one of pure urination or defecation spermatorrhœa; their presence, however, does not exclude the coincidence of gonorrhœal prostatitis or posterior urethritis.

DISCHARGE.—In chronic gonorrhœa the discharge may vary from a slight, glairy excess of moisture, expressible to the meatus with difficulty, to free, continual, or intermittent discharges.

The discharge, whatever its character, may be the only symptom which the patient observes. Some patients are singularly indifferent to this manifestation of disease when it gives them no inconvenience beyond filthiness; the majority, however, are mentally distressed, and in consequence physically disturbed, by an excess of moisture that does not even agglutinate the meatus. Whether this is on a purely æsthetic score or due to a specific lasting influence of gonococci toxins on the nervous system, is one of the questions neurologists still have to solve.

Whatever the character of the discharge, its contents and origin must be ascertained. Many microscopical examinations may be made without discovering any noxious bacteria. This does not entitle the physician to assert that none exist in the patient's genital apparatus (see Chapter XIV., Proofs of Cure of Gonorrhœa). Whether gonococci, with or without other bacteria, present in the slight or copious, permanent, intermittent or recurrent discharge, or if none are found, the origin of the discharge, *i.e.*, the diseased region or regions and the character of the disease, must be ascertained. The discharge itself is not characteristic of its source. While it can be determined by the kind or kinds of epithelia found, it is always well to give equal weight to the clinical manifestations. These are outlined, as are the methods for eliciting them, in Chapter VII., on the Complications of Gonorrhœa.

For convenient reference, and until a better arrangement is offered, I submit the following description of urethral discharges, which may be: continuous; in the mornings only; intermittent during the day; intermittent with several days', weeks' or months' interval (recurrent gonorrhœa); mixed with the last portion of urine, or immediately after urination (gonorrhœic and other prostaticorrhœa).

In regard to color and consistence, it may be: watery, albuminoid, rice-water, grayish, thin white, thick white, thin yellow, thick yellow, thick greenish-yellow, thick bloody.

These discharges may be mixed, as for instance the grayish discharge may be mottled with spots of white, yellow, or green, or it may be streaked with these colors.

I may be permitted to emphasize that this classification of the discharge of chronic gonorrhœa is offered solely for convenience of recording.

A form of discharge characteristic of prostatic involvement, and not mentioned above, has a tendency to be drawn out in long elastic filaments when taken between the fingers or when removed from the urethra with an instrument. When placed on a cover-glass it curls up into one or more glutinous heaps. When one endeavors to spread these heaps, they drag after the instrument with great tenacity. They are difficult to crush between cover-glasses, and require considerable rubbing to spread them with sufficient thinness into a "smear preparation" (Sternberg) for microscopical examination. Moreover, they require much more time for the air-drying than is usually necessary for flame fixation prior to staining. The microscope shows them to contain many prostatic epithelia and prostatic bodies, in addition to the other elements that characterize the special kind of infection.

DISCHARGES SIMULATING SPERMATORRHOEA.—Guyon and Jamin were the first to point out this symptom of chronic posterior gonorrhœa, which Guiard¹ compares to "little ejaculations" (*petites éjaculations*). It is the sudden, intermittent appearance of a large drop at the meatus. After the drop has passed to the linen, no more discharge can be expressed from the urethra, unless by persistent "milking" some normal secretion is produced from the pendulous portion. If the patient is not informed on the subject, he is likely to consider these discharges, occurring at irregular intervals, indications of spermatorrhœa or of urinary incontinence.

The stains on the linen produced by these discharges differ markedly from those made by anterior gonorrhœa. The occasional sudden stains are fewer in number and much larger than those of chronic anterior gonorrhœa. Both kinds of spots may appear together. Those ejected from the posterior urethra at irregular intervals generally have yellowish-white centres, with clearer and starch-like peripheries, when they have dried on the linen.

Ordinarily the emission of these drops is not accompanied by any sensation; their presence is then not noted except by the moisture at the meatus or on the shirt, which the patients occasionally feel. In some very rare cases the emission of this

¹Guiard: *Op. cit.*, p. 161.

drop is associated with a very brief, somewhat pleasurable sensation along the urethra, suggesting that produced by the ejaculation of semen.

Guyon emphasizes that the compressor will not yield to pressure from within until a sufficient degree thereof is exercised, and then urethroprostatic discharge is prevented from flowing into the bladder by the sphincter vesicæ. The discharge so retained, distending the posterior urethra, evokes reflex contractions of the ejaculatory muscles. This view is opposed by many authors, but Guiard's¹ observations fully support it.

While this seems the most rational explanation of this symptom, it cannot, however, be compared to the emptying of the posterior urethra in ejaculation of semen. During this act the posterior urethra is suddenly filled with semen, and while the ejaculatory muscles are stimulated to spasm thereby, the compressor in this spasm ordinarily yields intermittently, in concordance with their contractions. As opposed to the normal ejaculations the "little ejaculations," as Guiard designates them, appear to premise an extraordinary development of tonicity of the sphincter vesicæ, preventing the urethroprostatic accumulation from entering the bladder, which ordinarily is the point of least resistance. This extraordinary condition may explain the rarity of the symptom under discussion.

The extrusion of these drops from the posterior urethra certainly proves that a posterior gonorrhœa can persist after the anterior clap has subsided. It is undoubtedly important whenever they are present that their origin be ascertained. In this, aside of their macroscopic characteristics mentioned before, the microscope will give the final decision concerning their source, whether they proceed from anterior gonorrhœa, posterior gonorrhœa, seminal emissions, or the "after-dribbling" of urine.

EXCESSIVE MOISTURE.—In many cases, long after a gonorrhœa is cured, a watery or slightly gelatinoid excess is visible on opening the meatus, or can be stripped or milked from the urethra. If repeated microscopical examinations of this excess of normal moisture proves it to contain only mucus and normal epithelium, and if no other symptom of disease presents, it

¹ Guiard : *La Blennorrhagie chez l'homme*, p. 266, Rueff, Paris, 1894.

would be exceedingly unwise to subject the patient to any local treatment, no matter how persistently he may implore it.

The excessive moisture, unaccompanied by other manifestations of disease, may be due to a slight catarrhal condition or to constitutional depression. The latter is often caused by the neurotic state that so frequently is associated with and follows gonorrhœa.

Some patients acquire remarkable dexterity in expressing moisture from a perfectly healthy urethra at all times. In doing so, they keep the channel in an irritated condition, which ceases as soon as their thoughts can be diverted from continual concentration upon their genitalia.

If careful examination positively reveals complete absence of any local ailment, constitutional remedies will be required. Among these, the mixture of tr. cantharid. and iron, recommended many years ago by that eminent teacher Otis, will be found effective in the majority of cases.

With a view to facilitating the study of excess of moisture, its characters are here offered, preliminary to a better arrangement which doubtless will be made later.

In volume, the excess may be: expressible with difficulty, *i.e.*, slight in quantity; easily expressible, *i.e.*, in quantity not sufficient to form a drop, but enough to be visible as an excess when the meatus is opened.

In color, the excess may be: thin watery; thick watery; albuminoid, like raw albumen; gelatinoid; grayish; thin white (like milk and water); thick white, like cream; rice-water; yellowish-white; yellow; watery, white or yellow spotted or streaked; mixtures of any one or more of the above.

I repeat that this classification has no other purpose than ease of description.

EXCESSIVE SEXUAL DESIRE.—While the prostate or seminal vesicles or both are in a deteriorated condition from chronic gonorrhœa, or while the urethra still suffers from the disease or its effects, some patients may be annoyed with what they call a “teasing” or “nagging” impulse to indulge in sexual intercourse. This may occur without provocation, or in the presence of women who in no wise evoke sensuality, as in a public vehicle. Perhaps it may be well to call this symptom “genesic hyperæsthesia,” in order to concisely describe it. An extreme

case thereof manifested the following conditions: While at college, the patient, then aged twenty, contracted gonorrhœa, of which he was apparently cured. At twenty-eight he married, and became the father of three healthy children during five years. His wife was not infected by him. From the time of his only gonorrhœa, he was obliged to undergo continual mental struggles to master the sexual impulse. His business required much dictation to stenographers. In selecting these employées, he gave preference to those least likely to suggest lascivious thoughts. Imagining that the presence of any woman under propitious surroundings aggravated his condition, he eventually employed only men, but soon found that the sexual obsession was ever present, detracting materially from the mental concentration his business demanded. A long vacation from his work, and devotion to athletic exercise, brought no relief. He finally had recourse to bromides with but temporary relief, and the result that he became a bromide-habitué. When he was thirty-five years old, he was brought for consultation. The urethra showed a slight, hard infiltration close behind the posterior boundary of the fossa; the prostate was somewhat enlarged. Under dilatations of the urethra and prostatic massage for about six months, the conditions materially improved. When the genésic hyperæsthesia had subsided so far that it but rarely troubled him, and then only for a few moments, he unfortunately was misled into drinking too much champagne at a dinner. The next day the condition returned in an aggravated form; he reverted to large doses of potassium bromide and passed from observation for three months. He then wrote that he could not summon the courage to discontinue the bromide, which he knew would be required of him if he resumed treatment.

The majority of cases do not, however, terminate in so unhappy a manner, but yield to the treatment elsewhere discussed.

GONORRHOEAS THAT ARE CHRONIC FROM THE INCEPTION.—In some cases the manifestations of gonorrhœa are so slight, and their progress is so insidious, that they appear to have been chronic from the very beginning. These Guiard¹ calls *uréthrites chroniques d'emblée*. The only symptom may be so slight an oozing from the meatus as barely to attract attention. The ap-

¹ Guiard: *Les Uréthrites chroniques chez l'homme*, Rueff, Paris, 1898.

parent insignificance of this discharge has no relation to the relative number of gonococci it may contain, nor is the patient any the less exempt from complications and sequelæ of gonorrhœa than if it manifested itself in the hyperacute form.

I have not observed a case, however, in which a patient's first gonorrhœa began with this sole symptom of chronicity. This may explain the fact that the gonorrhœas apparently beginning as a chronic disease are more tenacious and resistant to treatment.

When the patient denies previous attacks, it may be accepted that his memory may be fallacious in this regard. Therefore it will be well to explore the urethra and adnexa as soon as possible for residua of previous trouble. These must then be promptly and thoroughly treated, however slight they may appear to be.

ITCHING or TICKLING is one of the most annoying and often one of the most persistent symptoms of chronic gonorrhœa. When a focus or several foci of inflammation or infiltration can be discovered by the urethroscope, the condition can be relieved by direct applications of silver nitrate or cupric sulphate. When itching or tickling oscillates with varying intensity between spots in the anterior and posterior urethra, it may be due: (1) To both these regions having diseased foci; then temporary greater irritation in a focus or foci in the anterior or posterior urethra may obscure that of the less disturbed region; (2) involvement of the seminal vesicles, prostate, or Cowper's glands, from which the irritation is reflected forward. In the latter case urethroscopy may show a perfectly normal channel; (3) fissure of the anus, hemorrhoids, or rectal disturbances.

When tickling or itching besets the posterior urethra, it is often referred to the rectum or anus. Such cases are frequently treated for a presumed rectal disease and even operated, naturally without result. On the other hand, a fissure of the rectum, especially when near the raphé, may cause urethral tickling or itching. Urethral treatment must then necessarily be fruitless.

It is necessary, therefore, most searchingly to explore the urethra, its adnexa, the anus, and rectum when itching or tickling in the urethra presents. This symptom is so harassing that the local disturbance seriously affects the patient; if long continued, it so influences his general condition as to unfit him for his vocation.

When the cause is in the urethra, it often is so minute that its location is difficult, even by the most careful urethroscopy. Then if all other causes can be excluded, dilatations and irrigations fortunately relieve the condition.

MEATUS, AGGLUTINATION OF.—In some cases the only manifestation of chronic gonorrhœa is a cohesion of the lips of the meatus. More frequently still the lips are agglutinated, requiring a little force to separate them. When the urethral secretion is a trifle greater than necessary to produce cohesion or agglutination, a little transparent pellicle or even a brownish crust may form from the secretion as it dries between and upon the lips of the meatus. This crust must not be confounded with the one found upon the meatus of uncleanly persons.

If the incrustation persists, it may make the beginning of urination, especially that of the first morning bladder evacuation, quite painful. The urinary stream tears the crust from the meatus and carries epithelium with it.

Agglutination and incrustation can be avoided in all cases by keeping the meatus covered with absorbent cotton soaked in bichloride 1:10,000 to 1:6,000, or boric acid four per cent. The cotton so prepared is applied after each urination as described under the head of Anterior Irrigations, in Chapter III.

The avoidance of this symptom, however, by no means implies its cure. A diagnosis is as necessary here as elsewhere. To ascertain its character, a small quantity of the substance that agglutinates the meatus is taken with a sterilized (flamed and cooled) platinum loop and placed upon a cover-glass. If the substance is so dry and hard that it cannot be spread very thinly upon the glass, a drop of distilled water added to it will quickly soften it, so that it can be spread, dried, flamed, stained, and examined in the usual manner (see Chapter XIV., Proofs of Cure of Gonorrhœa).

The microscopical examination of a specimen so prepared will show, in *simple urethrorrhœa*, epithelium, mucus, and perhaps an occasional leucocyte; in *chronic gonorrhœa*, all the above, deformed or thinned epithelia, or normal epithelia, pus cells, gonococci, and perhaps other bacteria; in *stricture*, when it causes the persistence of a gonorrhœa, all the above, and epithelia with loss of granulation of the epithelial nuclei or epithelia entirely without nuclei; in *uncleanliness*, mucus, epithelium from the

meatus, pus, dirt, and all kinds of bacteria; *in consequence of erections*, mucus, epithelia from several parts of the urethra, and spermatozoa.

MORNING DROP.—This term, like its French congener *goutte militaire*, is unfortunately used by many authors as a synonym for chronic gonorrhœa. In reality it is only a symptom, and by no means a constant one, of chronic gonorrhœal inflammation. When, in this disease, the discharge is continuous, there can be no drop that appears at the meatus, in the morning or after more or less prolonged intervals between urination; nor is a morning drop ordinarily found when the only symptom of chronic gonorrhœa is a stain on the linen.

The persistent presence of this drop after a night during which the patient has not urinated, by no means implies that the drop contains gonococci. On the other hand, the absence of gonococci from the drop does not prove that the patient is free from these bacteria. Therefore the appearance of this symptom, which may vary from a clear, colorless, to a gelatinoid, gray, mottled, white or yellow drop, demands not only microscopical examination, but also a thorough exploration of the entire urethra and its adnexa.

If the patient with no other symptom of disease than the morning drop cannot come to his physician's office before urinating, he should be instructed in the proper manner of taking the specimen on a cover-glass. This he then brings with him for examination.

Numerous observations of cases in which the morning drop free from gonococci was the only symptom of urethral disease, have led me to the opinion that its presence is due to the effect of gonococci held in some part of the lower urinary apparatus. The most painstaking and exhaustive examination may not reveal the focus of inflammation nor the site where the bacteria are residually held. To establish the presence or absence of gonococci it will be well, in such a case, to irrigate the urethra with silver nitrate 1:1,000 or 1:500, or mercuric bichloride 1:10,000. The discharge produced thereby can then be examined for gonococci. But whether they are or are not present, there will be no use in attempting to conquer the morning drop with any of the astringent injections of which so many are recommended. Even in the absence of any special focus of dis-

ease, the case must be treated by internal massage of the urethra, as directed when describing the treatment of chronic gonorrhœa by dilatations and irrigations.

PAINFUL EJACULATIONS.—In those not due to the ejaculatory spasm drawing upon nerve terminals compressed in infiltrations of the anterior urethra, the pain may be due to irritation of the chronically inflamed posterior urethra, just as urine, the normal stimulant to vesical contraction, gives pain in cystitis, and as light, the normal visual stimulant, gives pain in iritis. These painful ejaculations, however, are by no means essentially of gonorrhœal origin. In character they may be lancinating, burning, extending from the meatus to the rectum, or radiating to the testicles and lasting some time after coitus, which may be followed by scalding on urination. They are most frequent in excesses, such as are likely to be committed by middle-aged men in sexual relations with very young women. A most aggravated case in which painful ejaculation was the exclusive symptom of chronic anterior and posterior gonorrhœa, was that of an otherwise normal man, who screamed at the moment of ejaculation and fainted before entire conclusion of the act. Usually the patients with chronic anterior urethritis complain of no pain during ejaculation, or only a slight burning. When the pain is sharp, lancinating, stabbing, and extends to the region of the anus or rectum, chronic posterior urethritis is probably associated with disturbance of the anterior urethra, with or without involvement of the seminal vesicles or prostate, or both.

PAINFUL ERECTIONS.—These are comparatively rare when accompanied by sufficient genesic impulse to overshadow the pain. But there are cases in which erections without sexual desire are provoked by the presence of chronic localized inflammation; they then stretch the tense areas or draw upon them, producing exquisite pain, while increasing the inflammation. Many a man has mere mechanical erections from an overfilled bladder. When the urethra harbors a chronic gonorrhœa, the erections are, as a rule, more or less painful. They subside, however, as soon as the bladder is emptied.

PAINFUL URINATION may be frequently evoked in chronic gonorrhœa by abnormally irritating urine, as in oxaluria, from errors of diet, alcohol, coitus, or overexertion. The irritation

produced may cause reawakening of the dormant inflammation and with it recrudescence or increase of the discharge.

Painful urination in chronic gonorrhœa may also be caused by agglutination or incrustation of the meatus, produced by a small quantity of discharge drying upon or between the lips. When sealing of the meatus is very firm, the first urine forced from the bladder may distend the urethra most painfully, until the incrustation is torn off by the stream. This tearing away of the crust is necessarily also painful. With repetition of the act it rends epithelium from the meatus, leaving the lips denuded, and increasing the painfulness through the heavier incrustation and greater denudation that follow. Decided ulceration of the entire meatus can result, if the condition is neglected.

When alcohol or coitus or both have provoked the irritation, they must naturally be forbidden; when oxaluria is the cause, the diet must be regulated; in all cases, the patient should be ordered to drink large quantities, three or four quarts, of boiled water daily to dilute the urine.

Incrustation of the meatus can be entirely and easily prevented by causing the patient to keep the meatus continually wet with cotton soaked in bichloride or boric-acid solution as directed where irrigations are described. When the incrustations have formed, pain on urination can be avoided by soaking the penis in hot bichloride or boric solution until the crusts are softened and can be easily removed.

POST-COITAL SEMINAL DRIBBLING.—In some cases, in which coitus is normal, it is followed by more or less copious dribbling of semen from a but partially evacuated posterior urethra. This symptom is likely to occur as an independent manifestation of urethritis *ex libidine*. When sexual excesses take place during chronic urethritis, they are the more likely to provoke the same condition.

PREMATURE EJACULATIONS frequently overshadow the chronic gonorrhœa that causes them, and often indeed are the only symptom of the disease. The local symptom may be merely too brief intercourse before the ejaculation. A more marked form is that in which the emission occurs before intromission, with subsidence of the erection as the penis touches the external female genitalia. In still more aggravated cases, accidentally

brushing against female garments suffices to provoke the emission, while the penis obtains but momentary turgescence, which may be so evanescent as to pass unobserved.

In addition, these patients are usually depressed by fear of consumption from the frequent seminal losses, the dread of the permanent destruction of their sexual powers, and the fear of insanity, which they have cultivated mainly from charlatans' advertisements. The despair of these patients is not often overcome by the physician's assurances. They regain hope only when they observe the beginning of relief from mechanical treatment. While this is pursued, the closest attention must be given to the accessory treatment mentioned in Chapter VI.

SIMULATED ANTERIOR GONORRHOEA.—In some cases the compressor allows the secretion behind it continually to leak into the anterior urethra, giving the appearances of anterior urethritis. The first urine then coming from the bladder may wash out the entire urethra and thus be rendered turbid; the urine following, if it detaches no secretions, may be clear. But the last ounce of urine, forcibly ejected by the concluding efforts, may be rendered as turbid as the first, or more so, by the detrusor's compression of the diseased organs. If such a patient's anterior urethra is gently irrigated and then examined with the urethroscope, it will prove to be perfectly healthy. Therefore when a case of apparently chronic anterior urethritis does not yield to irrigations, the cause may be found in the posterior urethra.

In an extreme case of such a condition, the urethroscope found the compressor bulging forward. Slight pressure upon it with the distal end of the tube caused it to extrude enough secretion to nearly fill one fifth of the tube (30 F.).

STAINS ON LINEN.—Numerous patients present stains on the garments as the only evidence of chronic gonorrhœa. When this is the case, in most instances, all endeavors to strip a discharge from the urethra either fail, or bring to the meatus, but not expressible from it, only a slight excess of transparent moisture.

Almost invariably these stains on the garments produce more mental distress than the discharge did when it was copious, or the morning drop when it persisted.

A patient whose garments become the seat of such stains uses every possible means to impress the physician with their

importance as evidence of grave disease. One patient, a not at all ignorant practitioner, whom I had treated for chronic gonorrhœa, on returning from a visit at midnight, found several spots on his shirt flap when he undressed. He awoke me an hour later, and to prove that he was not cured produced the shirt, with assurance that he intended to commit suicide in my office. The color, shape, and appearance of the stains were utterly at variance with those that come from urethral disease. My patient was not convinced, however, until a microscopical examination, made at once, proved a complete absence of bacteria in the stains, which, however, contained an exceedingly large number of well-formed spermatozoa. He subsequently married the lady with whom he had spent the evening; her exceedingly good health and frequent pregnancies finally dispelled the doctor's apprehensions.

Some patients bring a formidable laundry bundle to show the harassing spots. One wore a shirt an entire week, during which he examined it hourly while awake; whenever he found a stain, he encircled it with indelible pencil and in the circle marked the date and hour of its discovery. Other patients cut the stained portions from the shirt flap and attach labels thereto, on which they write the same information. Impatience or derision will not relieve the sufferer's mental distress; reassurances regarding eventual cure are equally fruitless. The patients will not obtain mental tranquillity until they cease to find the stains.

When the stains are due to an excess of urethral secretion they probably are expelled whenever the secretion has accumulated in sufficient quantity to evoke slight, unperceived urethral contractions. The excess of urethral secretion may be due to slight post-gonorrhœal urethrorrhœa, to infiltration of the mucosa or of glands, or to stricture.

The gross clinical differences between the stains on the garments may be roughly tabulated as follows:

Stains from urethral discharge:	Stains from drops of urine (as in "after-dribbling," from enlarged prostate, or stricture):	Seminal stains:
Circular or ovoid.	Irregularly shaped; diffuse.	Shred-shaped or band-like.

Small, with sharply defined edges.	Large, with undefined edges.	Elevated edges.
Color same throughout.	Centre darker than periphery.	Varying thickness gives deeper color in spots.

As Diday has shown, the stains from urethral discharges, very soon after they escape, assume another color than that which they had when leaving the meatus. In the little table below I have added my observations to those of Diday:

A colorless discharge produces a starch-like stain.				
An opaline	"	"	" grayish	"
A white	"	"	" yellow	"
A yellow	"	"	" green	"
A green	"	"	" reddish-brown	"
A red	"	"	" mottled dark-brown stain.	

Whatever the origin of the stain, microscopical examination is necessary, not only for the patient's mental peace, but for diagnostic purposes as well. The stained spot is moistened with a drop of distilled water and rubbed upon a cover-glass. The stain so transferred is air-dried, flamed, colored, and mounted in the usual manner.

Even the most minute stains may contain gonococci; therefore they should not be lightly considered.

The treatment of the condition producing stains on the linen must be directed to its cause. The stains themselves, however, can be prevented from soiling the linen by keeping the glans continually covered with cotton, as directed under anterior irrigations.

URETHROSCOPIC FINDINGS.—The conditions of the urethra that sustain chronic gonorrhœa are sketched in the Outlines of Urethroscopy, Chapter XIII.

THE URINE IN CHRONIC GONORRHOEA is made the subject of exhaustive discussion in very many large scientific volumes. Manifestly, then, no more can be attempted here than very rough outlines of the coarser manifestations that are accessible to the beginner in practice and available for rapid office work in large practice. The latter, however, cannot be complete or satisfactory without at least one assistant continually devoted to microscopical research.

The urine used for examination should be passed in the physician's office. For convenience, tubes should be kept in

quantity as mentioned elsewhere (page 25). Previous to passing the urine, the patient's prepuce, glans, and meatus should be cleansed with absorbent cotton soaked in boric acid, so that the urine first passed does not carry into the tube the secretion of balanitis or the diversity of foreign bodies that are sometimes found about the glans. Among these Professor Guyon¹ enumerates mineral dust, coal, wool, silk, linen, hemp, cotton threads, bits of hair, feathers, grains of starch, etc. Some of these, by their presence, may prove decidedly misleading in macroscopical and microscopical examination of the urine.

The presence of some of these objects, as visible to the unaided eye as are the "floaters" mentioned on page 67, become of deep concern to a patient, who, like the majority, observes that at each visit the physician carefully notes them. When they do not proceed from the urethra, they are easily eliminated by the preliminary cleansing mentioned above.

Malodorous Urine.—This is frequently the first symptom which patients observe. It sometimes has a fishy odor in chronic posterior urethritis and in tumors of the bladder; an excessively aromatic odor after taking balsams (*e.g.*, santal oil); a violet-like odor—almost a perfume—after taking turpentine preparations, etc.

Turbid Urine.—If the first urine is turbid it is generally regarded as evidence of anterior urethritis. This, however, is open to error, as mentioned in connection with a consideration of simulated anterior gonorrhoea. If washing out the anterior urethra produces only clear wash-water and the first urine then passed is turbid, disease of the posterior urethra is fairly well established. If all the urine passed is turbid, it may be due to an inflammatory disease of any part of the urinary tract, except the anterior urethra, whose pus is generally washed away with the first 150 cgm. of urine.

Donné's Test.—If the turbidity is caused by pus, the addition of a saturated solution of caustic potash and then twirling the tube, will soon provoke that ropy separation which Donné, who devised the test, called "snotty." This forcible term (*rotzig*) does not seem to have yet found a more elegant and equally descriptive English equivalent.

¹ Guyon: *Maladies des Voies urinaires*, vol. i., p. 293, Baillière, Paris, 1894.

If *bacteruria* causes the turbidity, caustic potash will not separate the clear urine, as above described.

Phosphaturia can show the urine just as turbid as in either of the preceding conditions. A little nitric, hydrochloric, or acetic acid will, especially after boiling the urine, clear it with the formation of bubbles, causing it to resemble champagne. This excess of phosphates may accompany the act of digestion, especially in dyspeptics; it may follow mental exertion, anger, fright, or apprehension; it is almost always present in prostatic enlargement.

Perfectly clear and brilliant urine by no means proves absence of disease. Centrifuging the specimen may reveal slight but positive evidence that some part of the urinary apparatus is affected.

Shreds, flakes, filaments, granules in the urine are the symptoms which bring patients to us long after other manifestations of disease have passed. Roughly these substances found in clear urine or in urine not so turbid as to conceal them, become smaller with approaching restoration to health. With Guyon ("Maladies des Voies Urinaires") and Guiard ("Les Uréthrites Chroniques"), I deem the following general classification of these substances carried in the urine the most convenient for ordinary practical purposes:

<i>Purulent Filaments.</i>	<i>Muco-Purulent Filaments.</i>	<i>Mucous Filaments.</i>
Short.	Very much longer.	Uniformly transparent.
Multiple.	Less numerous, often have ends rolled into a ball, or are serpentine.	
Opaque. Yellowish.	Not homogeneous, but often consist of thicker spots, held together by a more transparent substance.	No opaque spots.
Fall rapidly to bottom; dissolve readily and increase turbidity.	Sink slowly and remain coherent a long time. By twirling the tube they can be made to rise from bottom.	Light; remain in the upper part or float on surface of the urine.
Easily removable from the urine with platinum loop.	More difficult to "fish" as proportion of pus diminishes.	Still more difficult to fish.

<i>Purulent Filaments.</i>	<i>Muco-Purulent Filaments.</i>	<i>Mucous Filaments.</i>
Easily spread upon cover-glass; no tendency to curl.	Tendency to roll into a thick slippery heap or serpentine mass upon cover-glass.	Tendency to roll into a clear, thick mass on cover-glass, where it dries very slowly and then is barely recognizable.
Microscopically: Large masses of leucocytes, few epithelial cells, no mucus.	Microscopically: Leucocytes, often with equal quantity of altered epithelial cells, englobed in a substratum of mucus.	Microscopically: Never exclusively mucus; always have some epithelial cells, often also a few leucocytes.

The omission of bacteria from the microscopical findings in the above table is intentional. They require separate extensive study. It must not, however, be forgotten that the heaviest, coarsest shreds may be free from gonococci, while the finest of short filaments may envelop an abundance of them.

The other salient symptoms of chronic gonorrhœa are mentioned under the Complications of Gonorrhœa, on page 38.

IX. TREATMENT OF CHRONIC GONORRHŒA.¹

Consistent with the character of this little book, theoretical considerations will here be entered into only so far as is necessary to outline the principles upon which treatment is based. For the same reason, space cannot be given to even mention of the many authors' names who have worked and are working so efficiently for the clearer comprehension of chronic gonorrhœa. Naturally no thought can be devoted to those who hopelessly, from preconceived notions or from lack of energy and persistence, deem chronic gonorrhœa incurable.

It seems in place here clearly to establish my position in regard to what is called by very many practitioners the "Valentine method." The success obtained by those who followed my

¹ This and the preceding chapter are somewhat elaborated, in accord with the results of two years' increased study and experience, from my article on "Chronic Gonorrhœa" published in the Clinical Recorder for January, 1898.

writings on the subject makes this designation doubly flattering to me. But those who employ the term, even for mere convenience, do an injustice to others, principally Oberlaender of Dresden and Janet of Paris. To Oberlaender belongs all credit for initiating and systematizing the use of dilators; to Janet is due all credit for methodizing and popularizing irrigations in the profession. The study of and experience with both methods led me to simplify and combine them. Since early in 1895 I began to teach the combination, but always emphasized the fact that it is based upon combination and a series of modifications of the methods advocated by the gentlemen whose names are mentioned above.

For practical purposes it is convenient to detail the treatment of chronic urethritis, of which less than ten per cent. are of other than gonorrhoeal origin, in describing the instruments employed. The finer pathological considerations upon which the treatment is based can be studied in the more extensive works on the subject.

The local treatment to be followed in a given case is predicated upon the conditions that present.

1. If the affection is superficial it will yield to irrigations, as described on page 18. Ordinarily one series, requiring eight days of such irrigations, will suffice to cure the case. Occasionally a repetition of this series of irrigations will be required.

2. If the urethritis causes structural changes of the mucosa, or involves the deeper tissues, or has invaded the ducts of the crypts, glands and follicles of the channel, dilatations will be required for their own effect. The manner in which these dilatations are performed is described on page 160 *et seq.*

3. If the urethritis depends upon invasion of the crypts, glands and follicles, these will have to be slit, curetted, or destroyed by electrolysis before the materies morbidæ they contain can be liberated. Similar treatment is required when diverticula or false passages complicate the case.

4. If neoplasms are the cause of the urethritis, they must be removed in accord with modern surgical principles.

5. If the urethral adnexa are involved, they must be treated as outlined under complications (Chapter VII.).

The urethroscope has a decided advantage over the phy-

sician who does not use this instrument, which exposes to sight the urethral disturbance. The patient has still greater advantage, for when the urethroscope is used treatment can at once be directed to the conditions found.

Until the physician has familiarized himself with the urethral appearances, his methods will necessarily be tentative. The diagnosis, then, being by a slow process of exclusion, is obtained by successive failures in treatment.

Superficial Invasions of the Mucosa.—The quantity, color, and consistence of the discharge, the presence or absence of specific bacteria, do not indicate the depth of the structural invasion. The epithelia contained in the discharge and in the urine, however, are valuable guides thereto; but their differentiation premisses a degree of special microscopical training whose acquisition cannot be too highly recommended. The microscopical findings, it must be remembered, are subject to great variability, often due to extraneous circumstances. Recognizing this, the most experienced microscopist will not decide on the absence of gonococci, in a given case, before making at least ten examinations of specimens, each taken at one or more days' interval.

The presence of many gonococci in a case of chronic urethritis does not necessarily convey that the disease has made deep ingression, or that serious structural changes exist, or that the adnexa are involved. Obversely, a specimen containing but few gonococci does not bear evidence that the case is a light one, or that it will respond readily to treatment.

Ordinarily a patient, the superficies of whose urethra are the site of the disease, may be expected to recover promptly after one, or at most two series of irrigations. These failing, the physician who has not assured himself of the condition by means of the urethroscope must conclude that deeper tissues are invaded, a fact which he could have established weeks before, had he examined the urethra. He will then proceed, as he would have done at once, to dilatations.

Structural Changes of the Mucous Superfices, the Deeper Tissues, or the Gland Ducts.—Despite the marked pathological differences between the conditions here placed together, their grouping is warranted by the fact that their efficient treatment is almost identical. As long as men have written on urethral diseases, drugs of all kinds have been proposed for the treatment of

these conditions and the others that maintain urethral discharges. The absurdity of expecting remedies injected into the urethra to cure changes in its structure does not seem to be yet quite evident to all. Indeed, even to-day a medical journal rarely appears without at least mention of one drug or formula advocated to cure chronic gonorrhœa. Occasionally, in consequence of vigorous advertising by the manufacturer, a drug acquires considerable vogue for a while. Soon it sinks into merited oblivion, to which it is relegated even by those who strenuously urged it.

Mechanical methods, too, have their advocates, and have had them for a long time. Many proved utopian, but most of these have the merit of leading to the use of dilators, which for fully fifteen years have proven effective in the hands of those who conscientiously employ them.

Regarding the dilatation treatment of chronic urethral diseases, Oberlaender¹ says: "As to the principle itself, upon which instrumental treatment is based, all agree that the purpose thereof is to stretch or burst infiltrations, be they hard or soft, by means of superficial or subcutaneous injury thereof." He further says that the end in view can hardly be attained with sounds, owing to the very frequent disproportion between the calibre of the meatus and the urethra. Moreover, the insertion of sounds sufficiently large to produce an effect upon the diseased areas is often painful; indeed even after the widest possible meatotomy it is frequently infeasible.

Some of the above facts which Oberlaender mentions, led him to work for a number of years with insufficient spring instruments. Accidentally an Otis divulsor then fell into his hands; in the course of time Oberlaender constructed a number of modifications thereof, suited for every zone of the urethra.

While a sense of justice compels unsparing credit to Oberlaender for his modifications of the dilators and his systematization of the treatment of chronic urethritis, and while he must be unqualifiedly acknowledged as the founder of the modern and rational treatment of this most frequent and erstwhile obstinate disease, an honest difference of opinion regard-

¹ Oberlaender: "Die chronischen Erkrankungen der männlichen Harnröhre." Klinisches Handbuch der Harn- und Sexualorgane, vol. iii., Vogel, Leipzig, 1894.

ing the principle on which it is based may be allowed. Experience and careful observation do not seem to make it necessary, nor is it at all obvious from his practice and writings, that the effect of dilatations is due to the stretchings or bursting of infiltrations. Their effect, on the contrary, seems due to the dynamic influence which Guyon so graphically attributes to sounds that lie loosely in a strictured or infiltrated urethra. It is within the experience of every practitioner that a urethra which easily admits a No. 1, 2 or 3 F. sound will, if the sound is left *in situ*, allow a No. 5, 6, or larger calibre to pass readily in twenty-four hours. After the same interval the patient finds that he emits a larger urinary stream, with less need of aid from abdominal pressure than before. The presence of the small sound lying loosely in the stricture therefore must induce a species of "retrograde metamorphosis," if this term may be so applied to the changes in the infiltration itself, that permit a part of it to be carried off. Inadequate and elementary as this explanation is, it is offered as an introductory to the study of the "dynamic influence" (Guyon) of instruments in the urethra and to the effect of dilators in chronic urethritis, as established by Oberlaender. His terms to "stretch and burst infiltrates" are thereby materially modified, as are whatever of violence or painfulness they may convey. Indeed, he does the same thing in urging gentleness in instrumentation and very gradual increase in dilatations.

The gentleness necessary in dilatations is practically emphasized when a very narrow canal or urethral hyperæsthesia prohibits the introduction of a dilator. Either condition must then be overcome by the preliminary use of flexible bougies, always selecting one that will readily glide through the urethra without producing pain. The limit of usefulness of these bougies is reached, usually at 18 or 20 F. when an Oberlaender dilator can be readily and painlessly inserted.

The preparatory treatment of the urethra by flexible bougies is subject to the same rules that govern the use of dilators. The practitioner will do well, however, to recall the precautions necessary for aseptic and thorough, albeit painless work with these instruments.

Previous to the introduction of any instrument, every effort should be made to prevent carrying with it infection into and

from one part of the urethra to another. Naturally, in the light of our present knowledge, no pretence can be made to rendering the urethra aseptic; yet every precaution must be employed to reduce the danger of infection. Cleansing, preliminary to urethral instrumentation, is most easily performed by irrigation of the channel as described on pages 12 and 18. When, as at a distance from the office, no irrigator is at hand, urethral washings may be performed with large hand syringes, such as are known as the Guyon or Janet syringes.

Dilators are inserted into the urethra in the same manner as are most other instruments. The penis, held erect in the left hand, causes the pendulous portion of the urethra to form an approximate right angle to the mesian line of the body. The fossa navicularis (scaphoid fossa) forms an obtuse angle with the urethra. Therefore an instrument to easily enter the canal should be guided first through the fossa in the direction of its lumen, then turned upward, to pass into the urethra. It may meet an excessively developed lacuna magna, which may receive the point of the instrument, and, if violence is employed, expose the patient to the dangers of urethral laceration. This danger is the greater the smaller the instrument employed. The lacuna magna is situated in the upper urethral wall; therefore, to avoid it, the instrument should here be guided along the floor of the canal. All works on surgery that have been searched on the matter of urethral instrumentation, except a paper by Murcell,¹ urge that the passage of an instrument throughout the anterior urethra must be along its roof, where it will meet with few or no rugosities. In theory this course seems correct. But the surgeon's concentration being directed to the roof of the urethra, he can allow the rugæ of its floor to escape the attention of the instrument which at the time is prolonging his tactile sense. Minute study and extended experience will make plain the greater safety and ease of adopting a diametrically opposite course. The smallest damage that can then be done is an interference with the easy passage of the instrument. This can be at once remedied, and it will be almost automatically done, if the tip of the instrument is made to hug the floor of the urethra. Then

¹ H. Temple Murcell: "Some Points in the Diagnosis and Treatment of Urethral Stricture." *Treatment*, July 27th, 1899.

the most minute impediment to its onward course causes the surgeon to withdraw the instrument ever so slightly and point its tip toward the roof enough to easily override the obstacle. In this manner urethrospasm, which would interfere with the work, is avoided, as is laceration of the urethra.

We are also urged to avoid the floor of the bulbous portion and the region beyond, as it is the urethra's least supported part, and therefore the one most exposed to injury. Again, in this regard a difference in opinion and practice from that of our justly most honored colleagues in the specialty, may be permitted. Greater safety to the region lies certainly in seeking it, with that exquisite gentleness which must characterize all genito-urinary work. Thus, if it be kept in mind that the sinus of the bulb may be quite a pouch and this obstacle to the instrument's progress be carefully sought, a slight withdrawal of the instrument and raising its point to override the opening of the pouch are more likely to lead to success than timorous avoidance of the region. When the compressor is passed, however, the point of the instrument must hug the roof of the posterior urethra, which here is the channel's true "surgical wall," to avoid contact with the sensitive caput gallinaginis and the mouths of the ducts that open in this region.

All dilators, except those provided with an irrigating device, are clothed with a rubber cover before their insertion into the urethra. Excellent covers for all the dilators are made according to my directions, by the Miller Rubber Manufacturing Company, of Akron, Ohio. These covers differ from those of European manufacture essentially in being about one millimetre greater in calibre and in being finished with a smooth, instead of a ribbed, surface. The greater calibre permits their easier adjustment to and removal from the dilators; their smooth surface makes the insertion of a dilator as painless as the correct introduction of a solid instrument with a highly finished, nickelled surface.

Clothing dilators with these new covers is performed by grasping the mouth of the cover with the left fingers and drawing the cover over the dilator. This can always be done with ease if the cover is thoroughly dry. No attempt should be made to apply a cover if it retains the slightest moisture from sterilization.

Although the element of expense has no weight in aseptic considerations, it is well to remember that the price at which these covers are furnished makes it quite an economy to throw them away after one use, in preference to devoting the time, labor, and cost of materials to their resterilization.

But, unless the covers are bought in a sterilized condition and enclosed in glass tubes, they should be sterilized before each use. To this end they must be scrubbed in boiling water with soap, each one then wrapped in a sterilized gauze napkin and boiled seven minutes in a one-per-cent. carbolic-acid solution. They may then be left to dry for use. Easier still is dry sterilization in formalin fumes, after scrubbing with soap and hot water. After sterilization and drying, if the wet method is employed, the covers must be placed in a long shallow glass or porcelain tray, closed with a tight-fitting lid of the same material. Beneath and upon each layer of sterilized covers a liberal quantity of finely powdered, sterilized talcum is dusted. If the gauze napkin is left open at the orifice of the cover, enough talcum will enter to keep its inner surface dry and facilitate its gliding upon and from the dilator.

After a dilator is clothed with its cover, the instrument is struck several times upon the gauze napkin that enveloped it. The napkin is folded or crumpled in the left hand to receive these blows by means of which any talcum adhering to the cover's outer surface is removed.

After clothing the dilator smoothly and assuring himself that folds are nowhere formed, the operator violently turns the screw at its handle, as if to forcibly burst the cover. When the branches of the dilator are so expanded to their fullest extent, every part of the cover is carefully examined for minute orifices. In new, well-made covers these will not be found. It is manifestly better that, if a cover contains holes or can be burst by the dilator, this be learned before it enters the urethra. A defective cover inserted would permit urethral secretions to enter the delicate joints of the dilator, and, what is far more important, endanger the urethral mucosa to being grasped and injured by the dilator's branches.

When the above tests of the cover's good condition are complete, it is lubricated from its point to half an inch along its shaft. The material experience has shown most useful for this

purpose is lubrichondrin, made according to Professor Bangs' direction. It is composed of the gelatinous substance of chondrus crispus (Irish moss) to which eucalyptus oil 1:1,000 and formaldehyde 1:1,500 are added. Lubrichondrin is sold in collapsible tubes and in glass-stoppered salt mouths. The former can be resterilized by boiling the closed tube in water. In using a tube its bottom is compressed to force out the con-

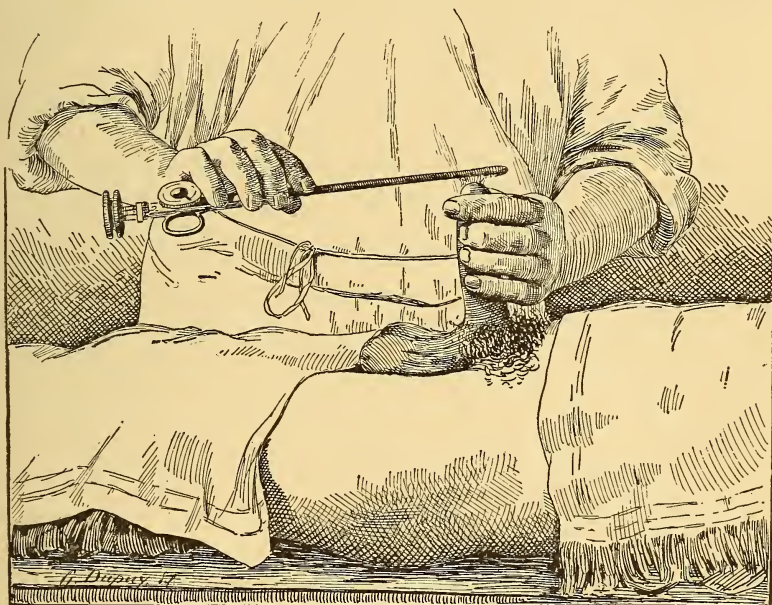


FIG. 40.—Lubricating the Meatus.

tents, of which the necessary quantity can be placed directly upon the dilator cover. When the bottles are used, about a sixth of a drachm of lubrichondrin is poured into a sterilized Petri dish, whence it can be readily taken upon the point of the dilator.

Unless the physician is ambidextrous, it will be well for him to stand at the right side of the table upon which the patient lies. The meatus being cleansed with cotton and bichloride, and the urethra washed as directed in this chapter, the penis is held as before suggested, and a part of the lubricant smeared upon and between the opened lips of the meatus by drawing one side of the covered dilator over them. Then the dilator

may be inserted. In doing this, no force whatever should be employed. When a dilator for the anterior urethra is used, it is best held as if it were a pen grasped for writing. While following the suggestions before made, until the posterior boundary of the fossa navicularis is passed, the right hand exercises



FIG. 41.—Oberlaender Anterior Dilator.

a species of restraining force to prevent the weight of the instrument violently plunging it into the urethra.

The selection of a dilator is necessarily predicated upon the location of the disease and the calibre of the urethra. If the anterior urethra alone requires treatment and the urethral calibre is still small, Oberlaender's anterior dilator is used. This instrument has a slight curve near its tip, to readily accommodate it to the normal curve of the anterior urethra. The tip is rather small, permitting its insinuation through a stricture so narrow that it will let no instrument beyond 10 F. pass. The smallness of the tip should be well kept in mind when using this instrument; if the greatest of gentleness is not employed, it may engage in a mucous fold, a wide open duct mouth, or a previously made false passage. The instrument will then not proceed. The slightest force employed is likely to produce serious urethral laceration. When an obstacle of any kind impedes the easy progress of the dilator, the instrument must be immediately withdrawn and a successive systematic series of other directions given its point. With well-developed tactile sense, however, the surgeon is enabled by gently touching all parts of the obstacle to form a clear mental picture of its character. When the point of the instrument has found the correct urethral lumen, it will easily, smoothly glide to its destination, unless again impeded by further obstacles. These then will have to be overcome in the same manner as the first.

Greater safety from injury to the urethra is obtained by inserting the Oberlaender anterior dilator by a technique similar to that employed in introducing dilators for the posterior urethra, which will be detailed in discussing these instruments.

The curve of the Oberlaender anterior dilator being the nearest approach to that of the anterior urethra therefore exercises the most direct pressure upon its roof and floor without distorting the canal. This consideration of the urethral curve is unnecessary when the channel is or has become sufficiently capacious to easily admit the Kollmann anterior dilator, which is described below.

The steps of inserting the Oberlaender anterior dilator are as follows :

1. The patient lies on a firm table with his legs extended and a sterilized towel placed upon his abdomen covering the pubis, another over his testicles and thighs. The penis rests upon the latter towel.

2. After the penis has been cleaned, the glans is taken between the left thumb and index finger.

3. The penis is gently placed in the direction of the right thigh, in a line continuing the left Poupart's ligament.

4. The clothed Oberlaender anterior dilator is then taken as

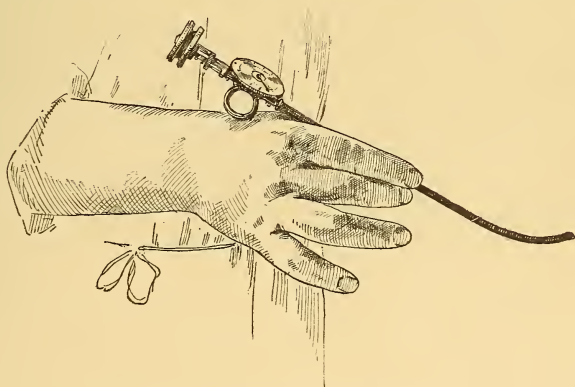


FIG. 42.—Manner of Holding Dilator.

before described, like a pen, with the face of the dial resting upon the interspace between the right thumb and index finger.

5. The tip of the instrument is inserted into the meatus.

6. After overcoming the angle at which the fossa stands to the urethra, the penis is drawn over the dilator, as a glove is drawn over a finger, but far more gently. The tip of the instrument is so guided along the floor of the urethra until the bulbous

portion is reached. The surgeon then experiences a sensation of reduced resistance at the instrument's point.

7. Without increasing the pressure, but keeping the tip immobile, the surgeon carries the penis containing the dilator in about a three-quarter circle in the same plane, around and beyond the patient's left side, until the dial of the dilator faces the linea alba at its commencement above the pubis.

8. Keeping the tip within the bulbous portion, the dilator is now gently tilted from the floor to the roof of this region, and

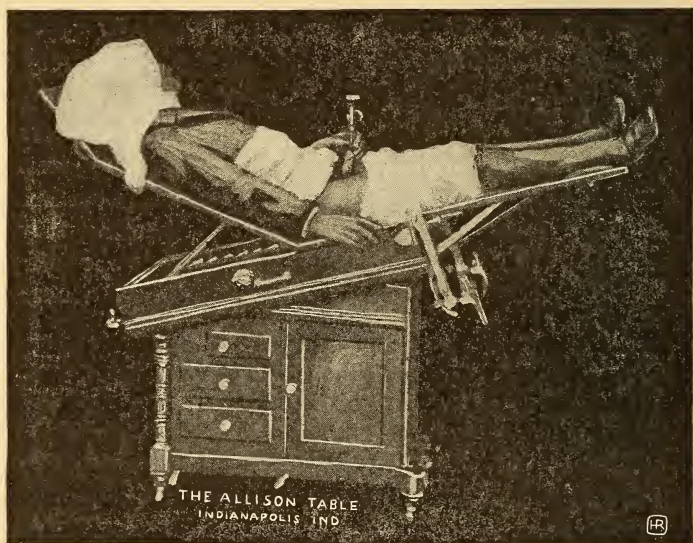


FIG. 43.—Patient in Position During Dilatation.

the penis with the dilator raised until it stands at right angles to the body.

9. The patient's elbow, either right or left, is rested against his side to steady his arm. He is then asked to grasp the dilator, where its cover projects from the meatus, and hold it in this position.

10. If the dilatation is to be in prolonged session it will materially contribute to the patient's comfort to raise the back of the table to about forty-five degrees and elevate its feet. I find the tables made by the Allison Company most convenient for the purpose, as well as for all other genito-urinary work done in the office.

Further manipulations with the Oberlaender anterior dilator do not differ essentially from those to be described in discussing the other dilators.

Kollmann's four-branched dilator for the anterior urethra is intended for use when the urethra's capacity is, or when previous dilatations have brought it to 21 F. The technique of its employment is the simplest of all dilators. After the dilator is clothed with its cover and lubricated, the penis is held in erect position by the left hand. The dilator is slowly inserted, observing the general rules before mentioned. The dial may be placed in any direction, as the instrument when closed is perfectly round. The one of choice will naturally be that in which the light strikes the dial, so that the figures thereon can be easily read.

Oberlaender's Béniqué-curve dilator exercises pressure only within the posterior urethra. The technique of its insertion is as follows:

1. Follow all the steps, from 1 to 8 inclusive, laid down for the introduction of the Oberlaender

anterior dilator.

2. When the tip of the instrument has been raised to the roof of the bulbous portion, guide it gently through the compressor, while letting the handle sink between the patient's thighs. In this motion, contact of the tip with the delicate and sensitive structures at the floor of the posterior urethra is avoided.

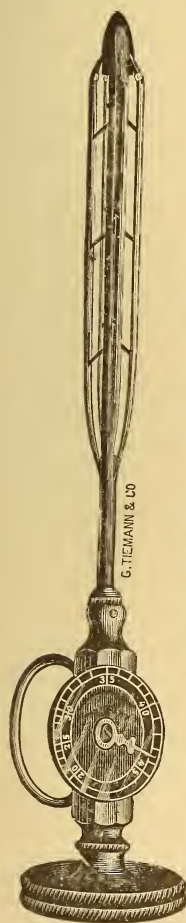


FIG. 44.—Kollmann's Four-Branched Anterior Dilator.

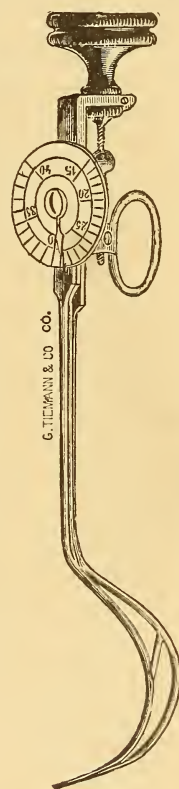


FIG. 45.—Oberlaender Béniqué-Curve Dilator for the Posterior Urethra.

Undeniably brilliant results are obtained in affections of the posterior urethra from the use of this dilator, without disturbing the anterior urethra. In the premature ejaculations due to irritability of the posterior urethra from masturbator's chronic hyperæmia, it often exercises a decided salutary effect. But it is not an instrument that can be recommended to any save those whom large experience has made familiar with intra-urethral work. The very great Béniqué curve, alarming as it may appear to the patient, allows the instrument to lie very easily in the urethra, without making any traction whatever upon its normal bend. But this very curve and its small tip make its introduction safe only in trained hands.

Kollmann's four-branched dilator for the bulb and posterior urethra is a much safer instrument to use. It cannot, however, be employed through an anterior urethra whose capacity is less than 21 F. Its large tip excludes the danger of injury, unless violence is employed. Its Guyon curve, about one-half of that of the Béniqué, does not exercise any appreciable traction upon the urethra, while its great weight adds to the ease of its introduction. The technique thereof is the same as that laid down for the Oberlaender posterior dilator.

Oberlaender's curved dilator for the posterior and anterior urethra is used when both these regions require dilatation. The technique of its introduction is identical with that directed for the Oberlaender Béniqué-curve dilator. The angle at which it is depressed between the thighs governs

the dilatation that is to be done within the bulbous portion or beyond. Dilatation of the anterior urethra is accomplished at the same time.

Kollmann's four-branched Guyon-curve antero-posterior

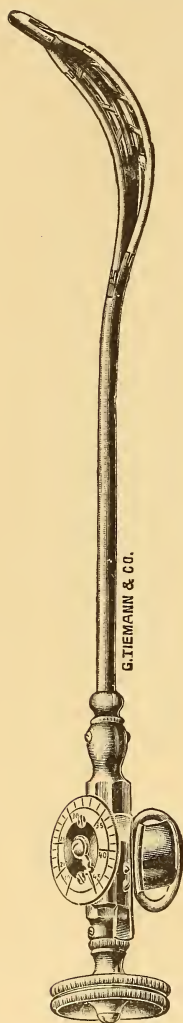


FIG. 46. — Kollmann's Four-Branched Dilator for the Bulb and Posterior Urethra.

dilator is applicable when both urethras require treatment and permit the passage of an instrument over 21 F. The technique of its insertion does not differ from that before described for the instruments intended for these regions.

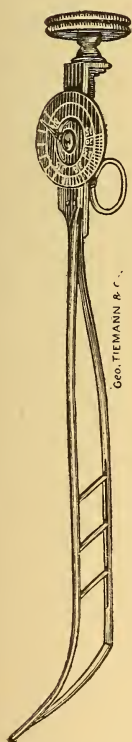


FIG. 47.—Oberlaender's Curved Dilator for the Posterior and Anterior Urethra.



FIG. 48.—Kollmann's Four-Branched Guyon-Curve Dilator, for the Posterior and Anterior Urethra.



FIG. 49.—Kollmann's Irrigating Dilator for the Anterior Urethra.



FIG. 50.—Kollmann's Irrigating Dilator for the Posterior and Anterior Urethra.

Kollmann, whose ingeniousness seems to have no limit, also devised irrigating dilators (Fig. 49 and 50). They are used without rubber covers. Surgical cleanliness of these irrigating dilators is obtained, according to the author's directions, as follows:

1. Place the dilator into absolute alcohol for an hour before use; then pass it over a flame, burning off all the alcohol that adheres to it.

2. When the dilator has grown cool, stand it upright in a tall vessel and force boric acid through its canals.

3. Previous to inserting it into the urethra, pass a sound and leave it there for a few moments.

4. Anoint the dilator freely with glycerin before inserting it.

5. After use, scrub the dilator vigorously with soap and water. After having dried it, cleanse with benzin applied by means of a tooth-brush, and then with absolute alcohol.

These dilators, when inserted, have a short rubber tube attached to one of their nipples and a long one to the other. The short tube is connected to a syringe by means of which the irrigation fluid is forced through the dilator into the urethra and gathered by outflow channels to the long rubber tube, which conducts it to a vessel below the table.

In exceptional cases this immediate combination of dilatation and irrigation proves useful. But the instruments, from their very construction, require the hands of the specialist for their use.

The technique of dilatations is the same for all dilators, viz. :

1. After the instrument is in the necessary position, so that the region known to be diseased embraces the branches of the dilator, it is held motionless long enough to allow the discomfort of its presence to pass off, if such discomfort is experienced at all. This varies from a few seconds to half a minute. During this time the penis is held steadily by the left hand and drawn out its full length, while the right hand keeps the dilator immovably in its position.

2. Grasp the penis with the four left fingers and palm, and extend the left thumb to the ring at the dilator's handle, thus holding both the penis and the dilator immovably together.

3. With the right thumb, index and middle fingers take the large screw-head or disc at the handle of the dilator and very gently turn it to the right. Continue this until the first slight resistance to its easy progress is felt.

4. If the patient is not extraordinarily timorous, it will then be well to entrust the dilator to him for a few moments. It occupies his attention and removes any apprehension he may

have of pain that may be produced. At the same time it avoids cramping the surgeon's fingers which would interfere with further delicate dilatations. The patient may be instructed to avoid cramp by holding the dilator with the other hand, when the one grows fatigued.

5. At the first séance leave the dilator at the first point of resistance for from three to five minutes, unless an especially spongy mucosa, as evidenced by bleeding, urethrospasm, hyperæsthesia, or fear of pain, obliges its removal before.

6. Close the dilator's branches by very slowly turning its screw-head to the left. In doing so, watch the dial and turn the screw-head no further than to leave it open one-half or one number F. to preclude the very remote and most unusual, but possible, accident of a collapse of the rubber cover permitting the branches, if closed entirely, to grasp the urethral mucosa.

7. Remove the Kollmann anterior dilator by drawing the penis back with the left hand and at the same time drawing the dilator from the urethra with the right. Remove any one of the other dilators by tilting the anterior margin of the instrument as if to dip it into the umbilicus; the penis will then drop between the legs, after the urethra has painlessly slid from the rubber cover.

8. After each dilatation, irrigate the region that was invaded: *i.e.*, after an anterior dilatation, irrigate the anterior urethra; after a posterior dilatation, irrigate the bladder. The solution most frequently employed for this purpose is potassium permanganate 1 : 6,000. In some cases this proves quite irritating after dilatation; then it may be used at one-half this strength, *viz.*, 1 : 12,000 or four-per-cent. boric-acid solution may be substituted. When the urethra harbors many other bacteria besides gonococci or without them, silver nitrate 1 : 5,000 or 1 : 3,000, or stronger if it can be borne, will be found effective.

Irrigations should never be omitted after dilatations or indeed any urethral instrumentation. Without them, the discharge is materially increased and often persists several weeks. Pain on and even between urinations may become quite severe and all the appearances of a new gonorrhœa may set in. The cause thereof is evident. If gonococci are squeezed from the mouths of ducts or from structural interstices, they may infect urethral regions that had returned to the normal state or that

had remained free from infection. The results of omission of irrigations after instrumentation, if they portend nothing further, would entail a delay in dilatations until the reawakened acute condition has yielded to additional treatment.

But another greater and more immediate danger attends omission of irrigations; that is, urethral fever ("catheter fever"). It will suffice to say here that since making it an inflexible rule to irrigate after each instrumentation, not a single case of urethral fever has resulted.

Frequently on the morning after a dilatation followed by irrigation, the patient will find a slight increase of the discharge. If this continues until the second morning, the urethra should be again irrigated on that day; rarely will a third irrigation be required.

The frequency of dilatations, the amount of dilatation and its duration at each séance, must necessarily be governed by the condition of each case, the toleration of the patient, and the results of the preceding dilatations.

A good average working rule to keep within the limits of safety is: (1) Begin with two dilatations weekly; (2) increase each dilatation one-half number F. over the preceding number reached; (3) prolong each séance two minutes. The longest séance, however, a patient can generally endure is forty-five minutes. Therefore when the séances have reached this limit, the dilatation desired must be attained within this time.

Variations from the above may become necessary:

1. When the increase of discharge persists, as it may in very rare cases, beyond three days. It must then be controlled by irrigations.

2. When marked improvement in the general and local condition shows that the intervals between dilatations may be extended. Experience has shown that recurrences are most likely to result when the intervals between treatments are too suddenly made. Therefore the extension must be gradual. Thus, for instance, if a patient was treated on Mondays and Thursdays, and it be determined on a Monday to extend the intervals between his visits, a risk would be incurred by asking him to omit the treatment for a week. Therefore the next appointment is made for Friday. If then he is found in continued improve-

ment, the following visit is set for Wednesday, and each interval increased by one day in this manner.

3. When it is found that the usual increase of dilatation by one-half F. over the preceding number, or even the preceding number itself cannot be reached without producing even slight pain, the patient may explain the condition by an intercurrent digression into the paths of Venus or Bacchus or both. Without such an occurrence the preceding dilatation may have produced a temporary swelling of the mucosa, which readily subsides. The physician, when such an impediment presents, contents himself by dilating as much as possible, without producing any discomfort. He may confidently reassure the patient that the time lost by delay in progress or even in decrease of the progress will be regained in a few sessions.

4. When a spongy mucosa, as shown by blood oozing from the meatus, a reawakened hyperæsthesia or urethrospasm command the removal of the instrument before the time required for the day's dilatation, the latter must be abbreviated.

5. When a dilatation is followed by oozing of blood from the meatus, bloody urination, or pain, the subsequent dilatations must be increased by but a quarter number at each session. If even this slow procedure is still followed by any of or all the disturbances mentioned, it will be well to substitute flexible bougies for the dilator until the use of the bougie no longer produces the objectionable symptoms. The bougie selected must be five numbers F. less than the last dilatation. Thus if the number reached by the dilator was 25, the bougie to take its place must be 20, or a size as much smaller as will glide through the urethra easily and painlessly.

While, as a rule, the increase of dilatation at each session of one-half number F. is not interrupted, this increase should never be obtained by force. Nor should the beginner attempt to exceed this, even when no resistance whatever presents thereto. Those most experienced in dilatations prefer the slow progress, because of the greater safety it assures.

The best practice is to stop dilating at the number last reached or at the first slightest resistance, and then at from three to five minutes' intervals to dilate at no more than half numbers, or up to slight resistance, until the number desired for the day is attained.

When a patient observes his improvement under dilatations, he is likely to urge more rapid advances than above directed. Such patients, when not watched, are tempted to surreptitiously give the dilator's screw-head a rapid turn. Those most prone to thus viciously maltreat their urethras are physicians afflicted with chronic gonorrhœa. Until a locking device is invented that will prevent such patients endangering their urethras, it will be well in their protection to refuse a continuance of treatment, unless they pledge themselves not to interfere with the case.

Bleeding to quite a considerable extent sometimes follows dilatations, especially in the beginning of treatment. Such a hemorrhage is usually of very short duration; if it threatens to become excessive, the penis may be compressed by a bandage until it ceases. Obstinate cases may require the pressure of a sound within the urethra in addition to the bandage. This failing, very cold water passed through a psychrophore will, in the majority of instances, arrest the bleeding. In extreme cases, such as are cited on page 77 (Complications), the urethra may be packed in the manner there described. When bleedings to any extent follow dilatations, it will be well to endeavor to control erections by the treatment mentioned on page 47 (Chordee), lest the erections cause the bleeding to recur at night.

As mentioned before, one of the results of dilatations is an increase of discharge on the morning following treatment, or its recurrence if no discharge existed. Oberlaender looks upon this as an evidence of the "melting" of infiltrations. However this may be interpreted, the discharge in a case that proceeds in the ordinary manner is less in quantity, thinner in consistence, and lighter in color at each recurrence, until it ceases entirely. The products of inflammation that are carried off in the urine become smaller and less in quantity. With these manifestations the general condition of the patient improves and local as well as reflex manifestations of disease fade away.

The limits of dilatation and irrigation are reached when no more evidences of disease exist or can be evoked by the tests mentioned in Chapter XIV. (The Proofs of Cure of Gonorrhœa).

There are but few conditions in which dilatations are contra-indicated. Decrepit persons, those in acute febrile conditions, those with large vesical tumors or with genito-urinary tuberculosis, or those in whom a severe posterior urethritis persists

must not be dilated. The last mentioned must be treated by irrigations, or by Guyon's instillations of silver nitrate, until the condition of the posterior urethra ceases to be an impediment to dilatations.

Invasion of the crypts, glands, and follicles was alluded to in this chapter under the third class of causes upon which the chronicity of a gonorrhœa may depend. In such a case dilata-

tions and irrigations will have no appreciable or lasting effect while these recesses harbor infectious bacteria. Any attempt to treat such cases,

except locally, by means of the urethroscope, must be abjectly hopeless.

Among the many inventions for which the profession is indebted to Kollmann are instruments for treating these cases. His urethral gland syringe is the first to be considered. By means of this little instrument silver nitrate can be injected directly into the invaded glands, as they are exposed by the urethroscope. These injections failing to effect a cure, the glands can be evacuated by his sharp curette. If curettage does not accomplish the desired end, his electrolytic needle will effectively destroy the invaded urethral adnexa. For this purpose, the needle is attached to the negative pole of the galvanic battery; the positive electrode is placed firmly upon the thigh.

The needle is then carefully inserted into the gland as deeply as is possible without force; the current is turned on very slowly. At two or three milliamperes, white bubbles will be seen rising from the gland about the needle; as the instrument is sunk deeper and swept about the gland, these bubbles increase. The surgeon will have to estimate the manipulations required to entirely destroy a gland. The time necessary varies from five to fifteen seconds. The pain of electrolysis is easily borne by most patients. An exceptionally sensitive case may require cocainization. To minimize the pain the current should not be made before the needle is inserted, nor should the needle be removed until the current is gradually reduced and finally

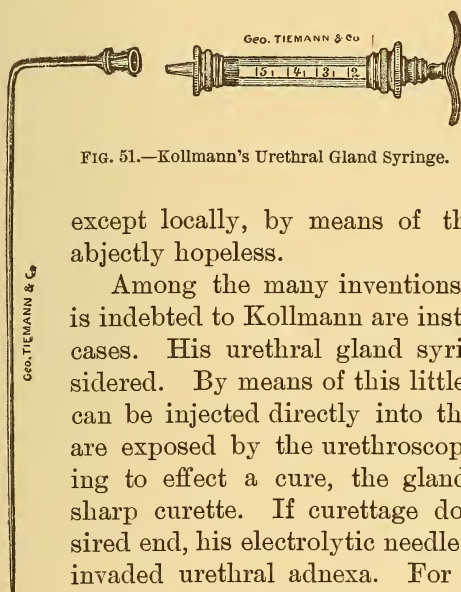


FIG. 51.—Kollmann's Urethral Gland Syringe.

broken. Ordinarily not more than three or four glands can be destroyed at one séance; even if the patient is willing to bear the prolonged pain, more such work would be inadvisable, owing to the excessive reaction that would thus be produced. The greater ease and safety with which the glands can be destroyed by electrolysis makes this method preferable to the intraglandular injection and curettage before described. The intensity of the reaction can be very much reduced, and often

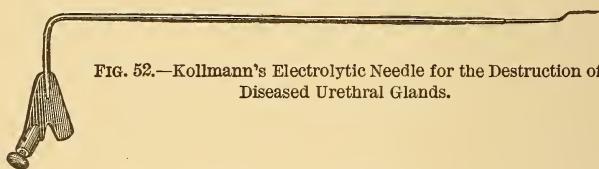


FIG. 52.—Kollmann's Electrolytic Needle for the Destruction of Diseased Urethral Glands.

entirely obviated, if each electrolytic séance is followed by an irrigation, as should be every instrumental invasion of the urethra.

Neoplasms of the urethra, mentioned in this chapter as the fourth class of conditions that maintain a urethritis chronic, are not amenable to treatment except by aid of the urethroscope. When they take the form of growths upon the urethral surface, they must be removed, as directed under Complications (page 50). When they are interstitial as well as superficial, they appear as dry, gray-looking cicatricial masses. Oberlaender recommends splitting these with his urethroscopic knife. The necessity of resorting to such incisions has not presented in my experience. Successive punctures of such infiltrates with Kollmann's electrolytic needle, each séance followed by an irrigation, have thus far sufficed to gradually overcome them. The objective point is usually best attained by treatment twice each week, one séance devoted to electrolysis and the other to dilatation.

Invasion of the urethral adnexa, placed in the fifth group of causes that maintain the chronicity of gonorrhœa, may present as Cowperitis, vesiculitis, or prostatitis, or two or all of these. Their treatment is sketched under Digital Palpation of the Urethral Adnexa, page 173.

Over-Treatment.—This cause for the continuance of a chronic urethritis has not been considered in the foregoing groups.

Very few of the best-known authors give it more than casual mention. Among these Fürbringer emphasizes the fact that the urine will contain filaments as long as the urethra is disturbed by instruments.

If a urethra that had never been infected were subjected to persistent instrumentation, even under the strictest aseptic precautions, it would sooner or later resept the intrusion, obedient to the maxim "*ubi irritatio, ibi affluxus*," if not otherwise than by irritative urethritis.

A urethra that was diseased and has recovered is necessarily at least as prone to be affected by unnecessary treatment. If all the tests advocated in Chapter XIV. (The Proofs of Cure in Gonorrhoea) yield a negative result, the physician will be justified in discontinuing treatment. But the exigencies of general practice, among other reasons, prevent many physicians from becoming sufficiently expert urethroscopists, microscopists, and chemical analysts of urine for this purpose. The test that then might suggest itself, would be to risk discontinuance of treatment, with intentions to resume it should evidences of disease again present. This would be as dangerous to the patient's health as it would be to the physician's reputation. I believe that I have devised a fairly effective means of covering such circumstances; this means is suggested when discussing the intervals between dilatations (page 162). Naturally it will apply only when, for any reason, the direct and decisive tests of cure cannot be made.

This suggestion is that when marked improvement shows itself, the intervals between treatments be prolonged one day each. On the third day of the second month after instituting such extension, the patient would have been eight days without treatment. If he continues to improve during this interval, the next one could safely be made twelve days. The improvement still continuing, the next interval could be eighteen days. This would bring the case to the third day of the third month of instituting the prolongation of intervals. Thus increasing the intervals between treatments by one-half each, after the eight days' interval has been reached in the ordinary course, would bring the next day of treatment twenty-seven days, or nearly a month from the preceding one.

Then it will be found that:

If the Urethra is still Diseased:

On the day after treatment the discharge may become evident again. This may continue several days.

The floaters in the urine may increase in dimensions and number on the day or for several days after treatment; then they grow less in number and smaller in dimensions, but do not disappear.

Toward the end of the interval between treatments or before, the discharge or excess of moisture may reappear; the "floaters" in the urine become more numerous and more gross.

If the Patient has Recovered:

Recrudescence of the discharge may continue, but not as many days as it would in a still diseased condition.

Floaters appear in the urine that was hitherto clear. They are, however, fine and few. They disappear soon.

The discharge does not reappear, nor does any abnormal moisture present at the meatus; the floaters do not reappear.

For the sake of emphasis it may be repeated that this means of establishing the need of continuance or cessation of treatment is exceedingly crude and prolonged, but it is offered to take the place of the other correct, scientific method when the latter is not available.

X. "RECURRENT" GONORRHOEA.

A deliberately intentional misnomer heads this chapter, for the purpose of grouping under it the recurrences of apparently cured gonorrhœa without new infection.

A recurrence, with or without an exciting cause, soon or many years after a clap has ceased to produce any manifestations, is but a symptom of residual gonorrhœa. Until the location of the residual (latent, quiescent) affection is ascertained, the disease cannot be cured, nor the patient relieved from its dangers. It is this phase of gonorrhœa that has misled some good men to deem it an incurable disease.

Recurrent gonorrhœa certainly offers great menaces to the patient and others, mainly because of the fancied security in which the former lives. Deeming himself cured, he may marry and infect his wife, or, with or without infecting her, the disease may recur in him so many years after the first or last attack that it had become but a dim shadow of the past. Unless it can

be made evident that he reinfected himself, a family disruption, because of the presumption of infidelity on part of either husband or wife, with all its sad consequences, is prone to result. This is especially likely to be the case if gonococci are found in the wife's genital secretions.

Few physicians indeed there are, in general practice or in the specialty, who have not seen such recurrences of gonorrhœa. They present the appearances of a new infection with some of or all its symptoms and expose the patient to all its complications and sequelæ.

The recurrence of such an uncured gonorrhœa may be, as said before, weeks, months, or many years after all manifestations of the disease have ceased.

The exciting cause may be: (1) Reduction of the patient's resistance by a debilitating disease, by exposure to inclement weather, by deprivation from proper food, by physical or mental overwork, by prolonged grief or anxiety; (2) prolonged excitement of the genitalia, or excessive intercourse; (3) dietetic irregularity, such as drinking more beer or other stimulants than was the patient's custom; (4) a traumatism of the genitals, provoking an inflammatory condition; (5) examination of the prostate, seminal vesicles, or Cowper's glands, when urinary disturbance causes the patient to seek professional advice; (6) examination of the urethra, as, for instance, when a stricture has sufficiently advanced to impede the urinary stream; (7) marital reinfection.

Whatever the exciting cause, the gross manifestations of the disease may be so marked and the appearance of gonococci so characteristic that the physician, unless he knows the patient very well, might believe, even if the patient is a colleague, that a new gonorrhœa has been recently contracted. While it is true that the infectious incident may have been forgotten, it is better to err on the side of charity and give the patient the benefit of the doubt.

Irrigations, as described in Chapters III. and V., will, in the majority of such cases, bring about an abatement of the disease, and often in a very few days. But the cause for its recurrence remains and is likely to reproduce it at any time. Therefore it behooves us to study these causes now as far as is compatible within the limits of this book.

When the recurrence is provoked by reduction of resistance

from any cause, proper nutrition, protection from exposure to atmospheric inclemencies, abstinence from overwork must be prescribed in addition to local treatment. Grief and anxiety are, however, beyond the sphere of professional advice, unless it be in that sympathy and encouragement by which the physician exercises his noblest duty.

In addition, these cases will require tonics. After several days of treatment, microscopical examination of the discharge and of the urine will serve as excellent guides to the locality of the residual infection. When the local manifestations have subsided or are reduced to a minimum, exploration of the urethra and its adnexa will usually confirm the microscopical diagnosis. Before the case can be dismissed, these must be treated, and after the proper interval, the patient submitted to the tests mentioned in Chapter XIV. (The Proofs of Cure of Gonorrhœa).

The second group of exciting causes of a gonorrhœal recurrence are perhaps the most difficult to ascertain. Few married men, except those lacking culture or refinement, will confess to genital dalliance with a partly willing female, such, for instance, as a well-developed, sensual-appearing servant. Yet some in whom the sexual sense, or lack of sense, is strongly pronounced are guilty of such acts, in which they perhaps preserve themselves from the possible consequences of infection or the woman from impregnation by abstaining from gratification of the so stimulated impulse. A step further in this class is shown by those who indulge in psychic masturbation. They give way to invoked phantasms of sexual relations with women they see in public or even with creatures of the imagination. Whether these practices lead to appreciable ejaculation or only to its verge, the effect of the hyperæmia is the same.

Those who had sexual intercourse once oftener than was their habit in a night can similarly produce an emptying of gonococci that long have lain residual upon the urethral mucosa, or stimulate them to renewed activity by the *urethritis ex libidine* that resulted.

The irritated condition of the urethra which often obtains from the excesses committed shortly after marriage may provoke a recurrence of gonorrhœa, if the husband's urethral adnexa hold gonococci. An illustrative case may here be cited:

A gentleman, aged 34, acquired gonorrhœa in his eighteenth

year. When he was twenty-eight he married, having had no manifestation of the disease for ten years. Shortly after his marriage, as so often happens, he had what appeared to be a very severe fresh attack of gonorrhœa. His wife was similarly affected. Conscious that for six months before he had not exposed himself to infection, and his wife but recently having been a virgin, he attributed their illness to that mysterious, albeit often quoted cause, a “strain,” for which he sought no treatment until violent orcho-epididymitis bound him to his bed. It progressed to suppuration, which caused the destruction of one epididymis and testicle.

After this he had no acute evidence of disease until five years later. His wife then had returned home after an absence of several weeks. Their first coitus was, within four days, followed by acute gonorrhœa in both. Never having been guilty of infidelity, he suspected her, with the usual result of a family disruption. This lasted until it was shown him that either or both could harbor gonococci for years without any appreciable manifestation thereof. In both, the disease yielded rapidly to irrigations. The wife, on subsequent examination, was found to be free from the disease. The husband, however, three weeks after responding negatively to all tests, when examined urethroscopically, showed some enlarged, gaping glands. Their contents being expressed with Kollmann’s spatula, showed gonococci, which, with an adequately exciting cause, would have sufficed to produce an apparently fresh clap. After electrolysis of these glands the patient resumed relations with his wife and his usual mode of high living. Examination of the entire genito-urinary apparatus six months later showed no abnormal condition, except, of course, the destroyed testicle and epididymis.

The third group of causes for the recrudescence of residual gonorrhœa are those attributable to dietetic irregularities. A glass of beer or wine in excess of the usual quantity drunk, or ingestion of the vegetables that provoke oxaluria or phosphaturia in susceptible cases, may set up enough urethral irritation to reproduce the discharge. In Germany the urethral irritation from young white wine and beer is well-known to the laity, whence arose the familiar designation of “Biertripper.” In all the cases of this Biertripper I could examine gonococci were found; each of these patients, however, acknowledged having had gonorrhœa. No doubt can obtain but that such a distinct urethritis occurs in cases that have never had gonorrhœa; it has, however, not been my fortune to meet one.

When such a *urethritis ab ingestis* provokes gonorrhœal re-

currence, success in treatment naturally is predicated upon prohibition of all irritating food, stimulants, and carbonated waters.

Traumatisms, mentioned before as the fourth class of causes for the recurrence of gonorrhœa, explain themselves. It is not necessary that the traumatism to the genitals be applied directly to the region which harbors gonococci; the inflammation resulting can readily extend to it and there provoke the recurrence.

The fifth division of cases in which a recurrence of gonorrhœa is provoked is distinctly due to the physician's inevitable diagnostic procedure, as shown by the following typical outline: A gentleman beyond middle life experiences gradually diminishing propulsive ability in expelling urine. The physician examines his prostate, and in so doing makes pressure upon it. While having his finger in the rectum, he completes his work by examining the seminal vesicles and Cowper's glands. If any of these adnexa harbor gonococci, from an infection of possibly many years ago, some can be emptied into the urethra by the manipulations necessary for a thorough examination. Ordinarily the urethra is not infected thereby; but if there be a point of weakened resistance in the urethra, acute gonorrhœa can result from this mode of infection.

The length of time in which gonococci can be harbored within the prostate, without in any way manifesting their presence to the patient, is well demonstrated by the following extreme case:

A gentleman had an attack of gonorrhœa in his eighteenth year. At twenty-six he married. His wife bore him two healthy children. When he was forty-three years old, his wife, who had not become pregnant for ten years, was taken with salpingitis at about the same time that he became affected with evidence of prostatic enlargement, such as diminution of the force of the stream, frequent nocturnal urination and inability entirely to empty his bladder. Examination of the enlarged gland brought forth a very small quantity of grayish muco-pus, which was found replete with gonococci.

So here is a case in which, for twenty-five years, the prostate held gonococci without any manifestation whatever, not even preventing the procreation of two healthy children.

In the sixth class of cases auto-infection, from the use of an exploring instrument to discover a stricture or a catheter to relieve retention, is far more readily comprehensible. The instru-

ment can impinge upon or scrape the mouth of an infarcted crypt, gland, or follicle and thus cause gonococci that have long lain residual therein, to be set free upon the mucosa.

The seventh set of cases, those in which gonorrhœa is due to marital reinfection, are mentioned here only to remind the student of such a possibility. The importance thereof will better be considered more in detail under Residual Gonorrhœa in Women (Chapter XII.).

The means for the diagnosis of these conditions and their treatment are outlined under the respective heads.

NOTE: The cases cited in this chapter are quoted from my report in the *Atlanta Medical and Surgical Journal*, for September, 1898.

XI. DIGITAL PALPATION OF THE URETHRAL ADNEXA.

As has been mentioned under the Complications of Gonorrhœa, the posterior urethra, the prostate, and the seminal vesicles frequently become involved in gonorrhœa. Cowper's glands often escape. If infection of one or more of these adnexa is unheeded, the case is likely to be interminable, from uninterrupted or occasional reinfection of the channel, as gonococci are carried to it from the organs mentioned.

A greater part of each of these adnexa can be reached only through the rectum by the finger, not alone for diagnostic, but for therapeutic purposes as well.

Digital exploration of the rectum, disagreeable and even painful as it sometimes is, cannot be avoided in the diagnosis and treatment of diseases of the seminal vesicles, the prostate, the base of the bladder, Cowper's glands, and the posterior urethra.

1. *Preparation of the Patient.*—Whenever possible, the examination should be made soon after the patient has evacuated his rectum. The presence of fecal masses or of a column of fæces renders the examination more disgusting than necessary. It also has a tendency to divert the physician's attention from his objective points. Many patients, especially if they have not defecated on the day of the examination, at once have a

desire for stool when the finger is inserted. The straining incidental thereto may thwart the effort at examination. This may go so far as to oblige an interruption of the examination, that the patient may go to the closet. The immediate resumption of digital exploration thereafter is only a renewal of everything unpleasant connected with the procedure. In such a case, it is generally advisable to defer further examination to the following day. Of course such prorogation cannot be considered when dealing with an acute case, or one requiring immediate treatment, as in periprostatic or prostatic abscess.

2. *When possible the patient empties his bladder*, preferably into two or three twelve-inch ignition tubes. Into one tube he passes 150 c.cgm. (about fl. $\frac{3}{4}$ v.), which is estimated to carry with it all the washings from the anterior urethra that can be detached by the stream. The second, third, or more tubes, according to the capacity of the bladder and the time that has elapsed since the last urination, should then be filled. The last 25 or 30 c.cgm. (about an ounce) should be voided into a separate tube, to ascertain whether the final expulsive efforts cause ejection of the contents of the prostate or seminal vesicles, as in urination-spermatorrhoea. As has been said before, separation of the urine in this manner does not serve for absolute diagnostic accuracy, but it often proves a valuable aid thereto.

Naturally, if the patient is severely strictured, or has incontinence from any cause, or retention from a much enlarged prostate, this preliminary step is omitted.

3. *Distending the Bladder*.—When no contraindication thereto exists, the bladder may be filled with a warm four-percent. boric-acid solution. Besides distending the bladder for the purpose of facilitating prostatic examination, this is the easiest means of ascertaining vesical capacity. Except where a large prostate acts as a dam for residual urine, the catheter and hand syringe (such as the Guyon or Janet syringes) are preferable for such measurement.

The use of boric acid for this purpose has other advantages, which will be mentioned further on (see 14).

4. *Position*.—The method often advocated, of bending a patient over a chair or the end of a table, is unsatisfactory. It obliges the surgeon to fix the pelvic viscera with his left hand, adding to the severe labor by the then necessary support of the

abdomen. As many of the cases requiring examination and massage of the prostate are quite corpulent, their management in this position becomes impossible. Moreover, in painful prostatic conditions, it may cause a patient to faint, or in epileptics may provoke an attack during examination.

For the above reasons and for convenience as well, it is best to examine all cases with the patient lying on his back on a couch or table, the knees somewhat raised, and the heel of the right foot resting in the hollow of the left. When the trousers are then drawn down to the ankles, there will be no difficulty in extending the knees as far apart as possible. A cushion under the buttocks is objectionable, as it throws the weight of the abdomen upward, which draws with it the pelvic viscera. In so doing it naturally renders the distance between the anus and the prostate greater, and thus unnecessarily enhances the difficulty of examination.

Instead of a cushion, a towel should be placed under the buttocks and left there, while the shirt is drawn up to beyond the hips. Most prostatic patients are very susceptible to change of temperature; the towel will protect their bared nates from coming into contact with the cold leather of the table or sofa. The same towel should be used by the patient for cleansing his anus of the lubricant employed in the examination. The majority will appreciate this care for their comfort and the cleanliness of their linen. They will also appreciate it highly if a clean towel is placed under their heads, so that the hair is protected from contact with the place where other patients have lain.

The preference for a sofa over a table for prostatic examination lies partly in the fact that the familiar piece of furniture inspires less dread than does the more strictly surgical implement; consequently there is less likelihood of spasm of the sphincter ani, which fear of pain is prone to induce. Again, the surgeon, being in the bent posture, can exercise greater thoroughness with less manifestation of physical effort than he could if the patient were on a table.

It is well to cover the lower third of the sofa with a tough rug, as the position of the patient with his knees drawn up and extended as widely apart as possible exposes his feet to slipping, and the sofa to being cut or at least mutilated by the patient's heels.

5. *Preparation of the Finger.*—For some time I used especially thin rubber cots to protect the index from contact with the rectum. No matter how thin, they always, by their presence, obtund sensation. Then, too, the thickened band at the open end constricts the finger, and this, producing some numbness by venous stasis, also renders the touch less acute.

In addition to thus reducing the finger's sensitiveness, these cots are difficult to remove. Even slitting them with a probe-pointed knife does not prevent the fecal soiling one sought to avoid by their use, for it is but crowded down their slippery surface to the root of the finger.

After discarding the finger-cots I for a while used short condoms ("rubber caps," Eichelcondome, capotes anglaises). The touch through them was somewhat better than through the equally thin cots. But their looseness about the finger often caused them to be swept off and left just within the sphincter ani. Attempts to fasten them with rubber bands produced the same constriction and consequent numbness which led the finger-cots to be discarded. Moreover the manufacture, importation, or sale of short condoms is forbidden by law; therefore there is something disagreeable in the necessarily surreptitious manner of obtaining them.

The use of common soap for the finger approaches perfection in rectal examination. The points most requiring protection are the sulcus beneath the nail and the matrix at its base. Of course no one in active genito-urinary work thinks of beginning his day's labors without filing and pumice-stoning his nails as close to the skin as possible. Still, a minute subungual furrow is inevitable, and it is in this furrow that the slightest trace of fecal odor makes itself so unpleasantly distinct, even after the most vigorous scrubbing. The rival of this spot for fecal defilement is the slightly overhanging skin at the matrix of the nail, which, despite the most assiduous trimming, cannot be kept down or even. Most genito-urinary practitioners who treat many cases daily, wash and scrub their hands very many times during office hours. It is true that at one of the large European clinics I saw a gentleman with a little bowl before him, containing about eight ounces of 1:1,000 mercuric bichloride solution. After each patient he dipped the tips of his fingers into this bowl and dried them on a towel—the one towel

serving him for perhaps a hundred cases. That he did not infect himself or carry infection from one patient to another could have been but a matter of luck. The matrices of his nails, too, were just as ragged as if he had used as much hot water and soap as do others.

When soap is used to protect the finger, the cake should be slightly moistened and then scraped with the index, in such a manner as to fill the matrix, as well as the interval between the nail and the skin at the tip of the finger. But after this is scrubbed off ever so vigorously and thoroughly, a match or toothpick scraped through these spaces will acquire a decided fecal odor. This is possibly due to some of the excremental constituents penetrating the soap.

When soap is used for this purpose, the finger can be rid of its bad smell by first thoroughly scrubbing it in intensely hot, running water; then crushing a few grains of potassic permanganate about the finger with the left hand. After the ozone-like smell of the permanganate becomes evident, the stain is removed with oxalic acid and numerous rinsings. The slight cuts and chaps one occasionally acquires despite the greatest care then become too painfully evident to pass unobserved.

Since January, 1899, I have used flexible collodion for finger protection in rectal examinations of the genito-urinary adnexa. It covers the finger tip with a pellicle which, if properly applied, does not break within the rectum. It in no wise obtunds sensation. The finger feels through it as acutely as if it were not covered at all. Only after the examination, when the finger is vigorously scrubbed with soap and very hot water, does the collodion separate and then in large flakes. These flakes are five or six times thicker than elsewhere, at the subungual space and at the matrix, the very points most easily invaded by rectal contents. Any bits of collodion that may remain are quickly removed by a little ether, which also dissolves the fats that hold the minute fecal masses adherent to the finger. Thus cleanliness after rectal exploration is easily obtained.

The best manner of securing a desirable coat for the finger is by dipping it into an ounce salt-mouth containing the flexible collodion. As soon as the first coat has dried, a second and finally a third may be applied in the same manner. This will give additional security and not interfere with sensation.

Special care should be exercised in not attempting to insert the finger before all parts of its collodion covering are perfectly dry. It may require several minutes to insure solidity of the little blebs that form between the finger and the collodion. If these are overlooked and the finger is inserted while they still exist, they will break in the rectum and produce severe burning as the ether of the collodion touches the mucosa. Besides the unnecessary suffering thus inflicted upon the patient, the points at which the collodion has so been broken will cause it to peel off in shreds and leave the finger exposed to contamination by the fecal odor.

6. *Protecting the Genitals.*—The patient being in position, with his trousers and drawers well drawn down to his ankles, as described under 4, the surgeon raises the scrotum with his left hand, so that the genitalia be not unnecessarily soiled with the lubricant that is now applied to the collodion-covered finger.

7. *Lubricating the Finger and Anus.*—When the entire right index finger is coated with collodion, as much lubrichondrin as can be taken up by it is placed upon the anus.

8. *Inserting the Finger.*—Most of the works I have been able to search are exceedingly meagre in their description of the entire technique of rectal digital examination. The most explicit are Hoffmann, Güterbock, and von Frisch.

The first¹ says: "The examining index finger, its vola turned upward, well oiled, is slowly inserted with gyrating motions, into the anus, after a thorough evacuation of the rectum."

Güterbock² offers but little more detail: "The oiled, carefully inserted finger feels, after traversing the excavation of the rectum that lies closely over the anus, first the bulb which offers somewhat increased resistance."

These directions certainly suffice for surgeons who have been well instructed. But not all have had the educational advantages that make further details superfluous.

Professor von Frisch,³ who describes the lower rectal findings

¹ Egon Hoffmann: "Die Krankheiten der Prostata." Zuelzer and Oberlaender's Klinisches Handbuch der Harn- und Sexualorgane, vol. iii., p. 3, Leipzig, 1894.

² Paul Güterbock: Die Krankheiten der Harnröhre und Prostata, p. 203, Leipzig and Vienna, 1890.

³ A. von Frisch: Die Krankheiten der Prostata, Holder, Vienna, 1899.

more in detail, offers the valuable advice that the hairs about the anus be separated before attempting to insert the finger. This additional precaution against giving the patient pain by dragging the hairs into the rectum will be especially appreciated by those who have been examined before without this care. Moreover, the examination will be easier to the physician because of the absence of the pain which dragging upon the hairs would produce and the anal rigidity it would evoke.

It is hardly necessary to call attention to the need of carefully avoiding any fissures or erosions about the anus, lest pain be given and aggravation of these conditions produced thereby.

The examiner's index finger, protected with flexible collodion, penetrates the mass of lubricant he has placed upon the anus. At the moment of an interval between expiration and just before beginning inspiration, he allows the finger to glide into the rectum. Any hesitation, gyration, or force will cause the patient to contract the sphincter and violently clasp the thighs together. The patient will certainly esteem more the efforts of one who, causing less or no pain, consequently performs better and more thorough work.

9. *Releasing the Scrotum.*—The left hand now being required to fix the pelvic viscera, it allows the scrotum to fall gently into the space between the right thumb and the extended right index finger.

10. *Fixing the Pelvic Viscera.*—The left hand is curved, the outer margin of the thumb placed about half an inch above and parallel to the pubis. By increasing pressure downward and backward, the pelvic contents are rendered as immovable as possible and approached, as far as can be, to the finger within the rectum.

11. *Raising the Perineum.*—When the index finger is about to approach the mass of lubricant on the anus the middle, ring, and little fingers are flexed; when the index penetrates the rectum, the other fingers are tightly closed upon the palm. The dorsal aspect of their basilar phalanges presses against the perineum as the index ingresses more deeply into the rectum. Meanwhile the forearm is depressed between the thighs until the elbow almost touches the couch upon which the patient lies. As this is being done the perineum is crowded upward, the surgeon avoiding contact with the tip of the coccyx.

12. *Position of the Thumb.*—If the thumb is doubled with the other fingers, it will be arrested by the ascending ramus of the pubis and thus materially limit the upward progress of the index within the rectum. When the hand is turned to avoid this, the knuckle of the thumb will impinge upon the anterior part of the perineum and give the patient unnecessary pain. It is therefore well to pass the thumb as high up as possible along the scrotum, while the index finger glides into the rectum.

13. *Palpation.*—The index finger, as it progresses into the rectum, ordinarily finds: (a) the excavation of the rectum, almost immediately above the anus; (b) the bulb which offers a somewhat increased resistance; (c) the pars nuda urethræ; (d) the apex of the rectal surface of the prostate; (e) the lobes of the prostate.

Even a short index finger, when the proper technique is carefully followed, can pass its tip about the topmost margins of the prostate and even beyond them, as in health the extreme upper curves of the prostatic lobes are between 7 and 8 cm. from the external anal margin.

With increasing practice the physician will learn to seek for the seminal vesicles and the ampullæ of the vasa beyond the prostate, and Cowper's glands below it, during the same rectal exploration. Ordinarily these adnexa cannot be found in health.

If prostatic enlargement always proceeded in its rectal direction alone, digital palpation would suffice for diagnosis. But as the diseased prostate can increase in size in any direction, other palpatory means than that furnished by the finger will be required.

In this a silver catheter with a short curve or with the Mercier beak will prove of valuable aid. If, the finger being in the rectum, such a catheter is inserted into the bladder, its tip is distinctly felt as it passes through the bulbous portion and with equal distinctness as it penetrates the pars nuda. It then disappears until its tip proceeds just beyond the prostate. A tight rubber band may then be slipped over the catheter just where it emerges from the meatus, while the penis is crowded as far back toward the pubis as possible. Then withdrawing the catheter, its point is concealed by the prostate from the finger in the rectum. Still further extracting the catheter, another rubber band is slipped over its shaft at the moment when

the finger within the rectum first feels it in the pars nuda, beneath the prostate. The distance between the two rubber bands will give a sufficiently precise measurement of the length of the prostatic urethra. This consequently will also reveal increase in the length of the prostate.

The thickness of the prostate and variations therein are discernible in the same manner. An aid to this is in close observation of the shaft of the catheter. Grossly it may be said that the less the prostate crowds into the bladder, the more will the external end of the catheter point upward, and the larger the prostatic ingression of the bladder, the more will it be inclined downward between the patient's thighs. Naturally this applies only when the shaft of the catheter has passed the prostatic urethra.

The cystoscope is doubtless the most valuable instrument for prostatic examination, when its encroachment is principally toward the bladder. But as cystoscopy is not within the province of the present effort, we may rest at its mention.

14. *Emptying the Bladder.*—The discomfort at least, if there be no severe pain incidental to rectal palpation, ordinarily affects the patient very much. Often the pupils will be found quite dilated, the pulse weak, and respiration disturbed. Some men grow very pale and are suffused with perspiration in consequence of the examination. It is well to have the patient remain in the position of the examination, but with extended legs, for at least five minutes, or at all events until all symptoms of the disturbance have passed off. He is then allowed to rise, and, in order to divert his attention, he is ordered to cleanse carefully the region about his anus of the lubricant lest it soil his linen.

It will be unwise to ask the patient to empty his bladder at once. The examination ordinarily produces a prolonged spasm of the compressor, which does not subside for five or ten minutes, and only then can the patient void the bladder contents.

15. *Microscopical Examination.*—When boric-acid solution or sterilized water has been used to dilate the bladder, it shows by its turbidity, when passed, that the prostatic contents or those of the seminal vesicles have been pressed out during the examination. If the palpation has been prolonged, the water

may also contain a little urine. Shreds from the bladder or urethra may also float in the liquid. To complete the diagnosis, the fluid should be sedimented or centrifuged and examined microscopically. By this means a guide to the organ affected will be obtained.

If the prostate is not so much enlarged as to preclude separate examination of the other urethral adnexa that can be reached through the rectum, these should be examined preferably a day or two after each other. While their shape and gross changes can be elicited at one examination when extreme prostatic enlargement does not prevent, the contents expressed from them are mingled in the urethra, and therefore the specimens obtained must be examined together.

The technique of separate examination of each of the other urethral adnexa is performed as follows:

16. *Seminal Vesicles*.—All the steps for examination of the prostate are taken. The finger passes the prostate without making any pressure upon it. Above the prostate and somewhat external to its sides, the vesicles project along the bladder. In health the vesicles cannot often be felt; in disease they present as somewhat enlarged sausage-shaped, soft or hard bodies. Occasionally distinct knots are felt in them. Their stripping or "milking" is performed by strokes similar to those used in massage of the prostate. Fuller's excellent work on "Disorders of the Male Sexual Organs" (Lea, 1895) is devoted to the study of diseases of the seminal vesicles, and to this work the reader is referred for exhaustive information.

17. *The Posterior Urethra*.—For examination of as much of the posterior urethra as can be reached through the rectum, the patient's bladder is first irrigated until the boric acid used is returned perfectly clear. Then the bladder is filled with distilled water, and the patient prepared as for a prostatic examination. The examining finger, however, leaves the prostate without pressing upon it, and exercises all its pressure on such parts of the urethra as are exposed, endeavoring at each stroke to compress the urethra more closely against the pubis. The distilled water then passed will contain such shreds, flakes, filaments, and granules as the urinary stream and irrigation could not detach from the walls of the posterior urethra. While the presence of gonococci in this "expression fluid" will serve to assist

in diagnosis, differentiation is not complete without urethroscopic examination.

18. *Cowper's Glands*.—Although these glands are not frequently involved, their examination should not be omitted. In health they are so minute as to be barely or not at all perceptible to the examining finger in the rectum. When it is engaged between the internal and external sphincter, somewhat doubled upon itself and carried forward in the direction of the perineal raphe, at either side thereof, these glands will be found.

In many cases of prostatic enlargement, of acute vesiculitis or cystitis, the bladder will not tolerate the preliminary distention mentioned above. The examination then must be made without this valuable assistance, and it consequently becomes more difficult.

It is particularly when the bladder is dilated that some of the contents of the adnexa escape from the meatus when pressure is made upon them. The discharge so obtained is then easily taken upon a cover-glass, and prepared for microscopical examination.

Massage of the prostate and stripping the seminal vesicles for therapeutic purposes are performed in practically the same manner. The tip of the finger engages, as high up as possible, the organ to be treated. At first gentle, slow strokes downward and toward the mesian line are made; these strokes are gradually increased in firmness and continued until the flattening of the organs shows that their removable contents are expressed, or at least as long as the patient can bear the manipulation.

In many cases the efficacy of prostatic massage can be enhanced by steadying the vesical side of the prostate by means of a sound, preferably of the Guyon curve. It requires, however, some dexterity to so incline the sound laterally within the bladder that it rests upon and thereby to a degree fixes the prostatic lobe that is being treated through the rectum.

The student need hardly be reminded that the first rectal manipulation is likely to be quite painful. Therefore extreme gentleness is as requisite here as it is in all other genito-urinary work. The relief patients experience is in most instances so great that they willingly submit to what soon grows to be a mere inconvenience. Indeed, many of them urge its repetition at shorter intervals than the judgment of the physician prescribes.

Only rarely can these organs bear massage or stripping oftener than twice or at most three times weekly. In exceptional cases daily massage may be required.

XII. RESIDUAL GONORRHŒA IN WOMEN.

Gynecologists have, in recent years, well exposed the disastrous consequences of gonorrhœa when it invades the womb and the organs beyond. They have also shown how amenable the disease is to treatment before it has passed beyond the vagina.

Many a woman, however, subjected to the older methods of treatment is only apparently cured. In consequence, she may at any time near or remote, infect a man, if the circumstances are propitious therefor. This form of the disease, which seems to be best defined by the term "residual gonorrhœa," has apparently not received the attention in literature that its importance merits.

In considering residual gonorrhœa in women, the disease adulterously acquired by the husband or wife may, in certain cases, be within the range of possibility. But adultery does not contribute to the understanding of residual gonorrhœa, unless the infection of the husband occurs long after all manifestations of the attack have subsided.

Again, the possibility of auto-infection on the part of the husband, who had gonorrhœa before marriage, as outlined in Chapter X., can explain a gonorrhœa in his wife, who may, if the husband is ignorant of such a possibility, be unjustly accused of infidelity.

The field for speculation and theorization in this connection is extremely wide, and most frequently no conclusions can be reached therefrom. Certain facts, however, are known. Among these are the not inconsiderable number of women who marry men while the latter are not cured of gonorrhœa. Many of these women, for at least a period of their lives, enjoy a species of immunity. Their resistance to gonorrhœal infection may at any time become impaired by slight causes. If the case receives prompt and energetic treatment, no residual gonorrhœa will result.

Many practitioners have been obliged to treat vaginitis in recently married women. Often this is so slight that it subsides with the employment of an antiseptic wash, a lead and opium lotion, or injections only of hot water. Since familiarity of practitioners with bacteriological staining has become greater, many of these cases are found to contain gonococci. Anti-gonorrhœal treatment being employed, the patients recover.

The majority of brides, however, do not inform any one of their ailments, which they conclude are the natural consequences of sexual intercourse. In very many cases, especially if the husband is considerably abstinent for a while, the infection apparently yields to the *vis medicatrix nature*.

In some cases the inflammation is so slight and its resultant discharge so scanty that, when gonococci are found in the minute excess of normal secretion, Guiard's *blennorrhagie chronique d'emblée* is suggested.

Most women, when brought for examination under suspicion of having infected their husbands, will unhesitatingly acknowledge having had leucorrhœa once or oftener in their lives. Some, however, have had so slight vaginal discharges that they attracted no attention because of that marvellous carelessness regarding the genitals which so widely extends in all classes of society. Whether these discharges were the result of gonorrhœal infection or were leucorrhœas due to other causes, is of course impossible to determine after they have passed off.

The cases that must be considered as residual present no external manifestations whatever. The urethra, the labia, the vagina, the cul-de-sac, and the os all appear perfectly normal. If consideration of the woman's health stops here, and the husband is cured, he is likely at any time to again contract the disease from his wife, without any crass evidences of the disease becoming manifest in her.

To illustrate as graphically as is possible to me, the conditions above outlined, I transcribe several typical cases from my records:

J. B.— aged 35, banker, in apparent good health, with no family or personal record of disease of any kind, was sent by a colleague on November 5th, 1897. The patient said that for three years he had been cohabiting with but one woman, of whose fidelity he had no doubt. Three weeks before, he had,

four days after intercourse, experienced slight burning on urination; soon a slight mucoid excess set in. The discharge rapidly became yellowish, then greenish-yellow, mixed with blood. With the increase of the discharge the pain on urination increased; painful erections were almost continual every night; the right epididymis was enlarged, not much hardened, but exquisitely sensitive. The last-mentioned complication caused him to be referred to me. The patient had been treated by the internal administration of balsams and various hand injections.

On examination of the discharge it was found to contain very little mucus, few leucocytes, few epithelial cells, and most of these from the second layer of the urethra. Everywhere the field was thick with pus cells, of which many seemed ready to burst from their repletion with gonococci. There were also many extracellular gonococci between the pus cells and some attached to the epithelial scales.

In brief, it was a distinct case of gonorrhœa. Irrigations and strapping the testicle enabled the patient to be dismissed from treatment on November 23d, 1897—*i.e.*, eighteen days after his first visit. Beer and champagne did not reproduce the discharge; injection of silver nitrate produced a non-microbic discharge lasting ten hours; coitus with a condom showed the semen to be normal; expression of the prostate and seminal vesicles proved freedom from infection of these organs; these tests were made a week apart. Then, a week later, a urethroscopic examination showed a healthy urethra.

On March 20th, 1898, the patient was again sent to me with some pain on urination, slight mucoid discharge easily expressible from the somewhat tumefied lips of the meatus. The first urine was turbid and contained coarse filaments, which sank rapidly to the bottom. The second urine was clear.

Microscopical examination of the discharge showed it to contain several groups of intracellular gonococci.

The patient assured me that he had cohabited with no other woman. His last intercourse had been four days previously, being two days before she began to menstruate, at which epoch she was more than ordinally sensual. They had not committed sexual excesses.

Under irrigations this discharge and all other symptoms ceased in five days.

During this time he told me that his mistress confessed to having been unfaithful to him about six months before, with a married man, whom he knew. The one-time partner of his mistress's favors confirmed her confession, but averred that he never had had any venereal disease.

I suggested that if my patient had never been infected before, possibly his mistress had, previous to their acquaintance, and that she might unconsciously be carrying a residual gonor-

rhœa, which from the hyperæmia incidental to the pre- and post-menstrual days would become manifest. He then wrote her, severing their relations. She came to his office and in tears violently protested against being cast off. In the heat of her asseverations, she confessed to having cohabited with a number of men, whose names she revealed, so that he might assure himself that none of them had been infected by her.

On her insistence that she be examined in his presence, he brought her to me.

To safeguard my position regarding what might otherwise imply a violation of professional confidence, I asked whether she were willing that I tell him my findings in her presence. To this she promptly consented.

On examination, I found her genitalia in apparently perfect health. Careful scrapings from the introitus, Bartholini's glands, the meatus, the vaginal walls, the cul-de-sac, the cervix, all showed normal epithelium, some mucus, and the usual vaginal bacteria.

I then carefully irrigated the genitalia with hot boric-acid solution, sterilized my hands, and packed the vagina with sterilized cotton tampons soaked in sterilized glycerin. On removing these forty-eight hours later, I found a slight excess of whitish discharge upon the small tampon that had rested in the cul-de-sac and some slight oozing from the os. Examination of these discharges, so evoked from the submucous layers, was found to contain distinct groups of gonococci.

The patient then told her lover, in my presence, that about a year before she first knew him, she had had a slight vaginal discharge, which had been diagnosed as leucorrhœa; this had promptly yielded to treatment. As an explanation for infecting him and not others, she offered that he was the only one with whom she experienced an orgasm, while she merely submitted to the others for the sake of financial gain.

A similar case was brought me three years ago.

A young married woman infected her lover. She confessed to having been cured of gonorrhœa acquired as a result of her first adultery, while her husband was on a long voyage. He was never infected by her. She said that though her husband was sexually more potent than her lover, and physically better developed, he never produced an orgasm in her. This she attributed to her dislike for him. Each coitus with her lover, however, was complete.

Examination revealed an exceedingly slight endocervicitis which, however, contained no gonococci. Only upon curetting the cervix, some discharge was obtained containing Neisser's specific microbe of gonorrhœa. In this case it seemed safe to

say that the spasm of the orgasm discharged in this instance gonococci, which reached the lover's meatus.

In a third case, seen with a colleague, the patient was a young woman, who claimed to suffer from occasional erotomania. When the condition was severe she assumed the part of a prostitute. Frequent cohabitation did not relieve the desire, unless the man's physique or mentality especially pleased her. Then coitus produced an orgasm. She was sure, whenever this occurred, that she had infected the man. Her physician told me that she had sent him a number of patients, for whose treatment she had paid, whenever the patient would permit it. She unhesitatingly related that she had had gonorrhœa four years previous to consultation.

Examination evinced no excess of secretion, but a thorough curettage revealed that the deeper uterine mucosa harbored gonococci. This young woman, though continuing her course, afterward infected no others.

A number of similar cases could be thus sketched to warrant the following deductions:

(1) A woman can have residual gonorrhœa, without any external manifestations. (2) A woman with residual gonorrhœa is more likely to infect a man cohabiting with her during the hyperæmia immediately preceding or still remaining after menstruation. (3) The likelihood of infection is probably greater if the coitus produces an orgasm in the woman. (4) Packing the cul-de-sac, as employed in the first case cited, may produce a slight discharge, revealing the submucous habitat of gonococci. (5) A submucous intra-uterine habitat of gonococci can be reached only by thorough curettage. (6) No woman should be pronounced cured of gonorrhœa until the osmosis test mentioned above (4) has proved negative, and until expression of the urethra and Bartholini's glands, and scrapings from the cervix and uterine lining are proven to be free from gonococci.

NOTE: This chapter is elaborated from an article I contributed to the *American Journal of Surgery and Gynecology* (St. Louis), May, 1898.

XIII. URETHROSCOPY.

As has been repeatedly observed in the preceding chapters, a diagnosis of a chronic urethral disease cannot be even approximately complete without visual examination of the channel.

Obedient to surgical principles, no instrument may be introduced into the urethra while it is acutely inflamed. The only exceptions thereto are when a foreign body requires removal or when retention demands relief by the catheter, after other means of voiding the bladder have failed.

In Chapter VIII. (Chronic Gonorrhœa) mention was made of the fact that without the aid of the urethroscope, all treatment of chronic urethral diseases must be tentative. With its assistance, the diagnosis can be made early, the treatment directed to the cause, and recovery expedited.

But as easy as urethroscopy is, and as simple as its technique has become, it can be acquired only most laboriously from written descriptions. The certainty of diagnosis it gives, however, is worth all the efforts devoted to acquiring it. In this it does not differ from other instruments of precision, such as the ophthalmoscope, the laryngoscope, etc., except that its manipulations are less difficult.

The technique of urethroscopy can be most readily acquired by a few lessons from a colleague, who has been properly instructed. A recognition of the multifarious conditions seen and their diagnostic interpretation can come only with experience. All efforts to pictorially present the urethral conditions have hitherto failed, at least, in being of use to the beginner. The essential difficulty seems in the reproduction of the colors, which are seen in the urethra under electric illumination. The pictures lithographed all appear too lurid, when an attempt to reproduce them is made. Exceptions thereto are the sectional colored pictures illustrating Oberlaender's¹ work, but as they are schematic, showing the walls of the urethra in section, they are of use only, and of most valuable use, to the urethroscopist of some experience. Kollmann's black and white photographs of the urethra are also invaluable to the advanced urethroscopist; it would certainly be desirable if the method of photographing the urethra devised by him were in the hands of all genito-urinary specialists, whose records and reports would be vastly enhanced in value thereby.

The reasons wherefor the urethroscope is not more generally used seem to be because: (1) Of the complicated character of

¹ Oberlaender: *Lehrbuch der Urethroskopie*, Thieme, Leipzig, 1893.

the instruments for direct illumination; (2) of defective lighting; (3) of the high cost of the instrumentarium.

The consequence is, that the treatment of chronic gonorrhœa continues to be with some the most unhappy guesswork. To others it is a hopeless task, undertaken with misgivings and discarded in desperation. What wonder then that the quacks make this their favored field, to begin with promises, to end with the patient's purse! The immense number of men whose lives are rendered miserable and abbreviated by chronic gonorrhœa, make all efforts on their behalf, and on behalf of their wives and children, worthy of most serious consideration.

Manifestly then, an instrument is necessary to show the practitioner the exact location and precise character of the disease. The instrument must effectively do its work, must be simple in construction, easy of use, not prone to get out of order, and always reliable.

If the opinion of those who honor me by calling me their fellow-specialist is a guide, as it is on other matters, all these ends are accomplished by the urethroscope I had the privilege of publicly demonstrating for the first time before our Genito-Urinary Section of the New York Academy of Medicine on March 14th, 1899.

This instrument, made for me by the Electro-Surgical Company, consists of *urethroscopic tubes*, running from Nos. 24 to 32

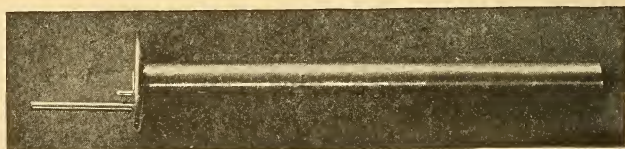


FIG. 53.—Urethroscopic Tubes.

F. In general appearance they differ little from the Nitze-Oberlaender tubes with burnished ends as modified by Kollmann. This modification permits urethral examination from behind forward as well as from before backward. The disc at the visual end is, however, larger, to safely hold the spur for easy and firm attachment of the light-carrier and the megaloscope.

Each tube is provided with an *obturator*, stamped on the handle to correspond with the tube to which it belongs. The distal end closes the urethral tube to permit its easy introduc-

tion, and has a deep slit corresponding with a similar slit in the handle. This slit permits air to readily enter the tube, facilitating the removal of the obturator by then preventing any suction upon the urethral mucosa.



FIG. 54.—Obturator.

The *light-carrier* is a delicate but very firm strip containing the insulated wires that illuminate the lamp which is enclosed in a glass capsule. By this means bright light is brought into almost immediate contact with the spots to be examined, be they ever so small. At its proximal end the light-carrier has an expansion, which can readily be attached to the spur on the disc of the urethroscopic tube. From the expansion the insulated connections for the conducting wires project, but are so



FIG. 55.—Light-Carrier.

curved that they do not encroach upon the visual orifice of the urethral tube.

The light-carrier in general appearance resembles the one used in the Nitze-Oberlaender urethroscope. It differs essentially, however, in that the lamp gives no appreciable heat, and consequently requires none of the cumbersome water-cooling arrangements that are necessary when an uncovered light is used. Furthermore, the lamp being fixed permanently at its end, is not exposed to twisting and short-circuiting, as happens almost continually with what hitherto was the best instrument for direct illumination. Nor is this lamp likely to burn out, unless the most gross carelessness is employed.

Moreover, the light being enclosed in glass, permits the lamp to remain in place while swabbing the secretions from the urethra, performing cauterizations, slitting infiltrated glands, electrolysis, finding the opening of devious strictures, and every other diagnostic and remedial procedure, all under the guidance of sight.

The *megaloscope* is a series of lenses combined in a short tube, attachable by a ring to the spur on the disc. By means of the megaloscope, whose focus is easily changed, the view of every part of the urethra can be immensely magnified. The interspace between the visual orifice of the tube and the objective end of the megaloscope is three-fourths of an inch, to allow the introduction of instruments for operative procedures within the urethra.

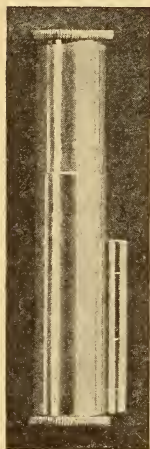


FIG. 56.—
Megaloscope.

The *urethroscope*, with all the appurtenances described, is enclosed in a case, whose total weight is about ten pounds. At the price at which the fresh dry cells are furnished, the cost of each urethroscopy is within half a cent.

The foregoing shows that I have devised only improvements upon and mainly simplifications of existing instruments. This urethroscope in its entirety, however, differs from the Nitze-Oberlaender apparatus in being easily transportable, thus making it unnecessary to reserve a room in the office suite for this purpose, or of having an urethroscopic outfit for each room.

When science and benefit to humanity are objective points, the question of priority is of no importance. Still it may be well to sketch the history of this instrument. In 1894 I expressed to my friend and fellow-student, Dr. Henry Koch, the opinion that urethroscopy by direct illumination would not find favor with the profession unless the water-cooling arrangement could be dispensed with and the apparatus further simplified as to the source of illumination and in other regards. It seemed to me that the first step in this direction would be in the production of a sufficiently small encapsulated light. Late in 1898 Dr. Koch found that Mr. W. C. Preston could make such a light. Experiments with it led me to suggest the construction of the apparatus above described.¹

The *technique of urethroscopy*, as suggested before, is exceed-

¹ As this book is going to press, Messrs. George Tiemann & Company, of New York, are placing before the profession a urethroscopic apparatus embracing all the improvements that continued study and experience have demonstrated to be necessary for aseptic, effective, and convenient work.

ingly simple. One demonstration usually suffices to impart all its details. As, however, all cannot avail themselves of such personal instruction, an attempt is here made to substitute it, as well as my descriptive powers will allow.

ANTERIOR URETHROSCOPY.—1. Have the patient lie on an operating-table, or sit on a high chair. The former is always preferable, especially when an intra-urethral operation is to be performed or when remedies are to be applied. When a chair is used the patient should sit as far forward as possible upon its front edge, its back supporting his shoulders, and his legs wide apart.

2. Cleanse the foreskin, glans, and meatus thoroughly with absorbent cotton soaked in bichloride 1:6,000.

3. Select the urethroscopic tube that will readily pass the meatus. Those experienced in urethroscopy will have no difficulty in doing this. The novice will do well to employ a Piffard meatometer, which often reveals that a meatus which appears to be very tight is rapidly, painlessly extensible so that it will offer no resistance to a very large tube. On the other hand, it will often show that quite a large meatus is no guide to a very tight posterior boundary of the fossa navicularis. In the latter case, a much smaller tube must be used or a preliminary deep meatotomy performed.

4. After cleansing the tube and obturator, pass each one separately through the flame of an alcohol lamp or Bunsen burner. Then insert the obturator into the tube and pour glycerin upon them until the tube, and especially the projecting tip of the obturator, is thoroughly lubricated.

5. Take the penis in the left hand as for anterior irrigations and wipe upon the meatus some of the excess of the glycerin from the tube in the same manner as was recommended before (insertion of a dilator, *vide* page 153).

6. Insert the tube gently, without any gyrating motions, until it is arrested by the compressor urethræ or the anterior layer of the triangular ligament. If it does not proceed so far without the employment of force, stricture or some other abnormality obstructs its progress. Then a smaller tube must be used. Only exceptionally is there any practical value in employing a tube smaller than a 24 F., save by urethroscopic experts. A tube so large as to give pain or to produce excessive bleeding thwarts the purposes of urethroscopy.

7. Withdraw the obturator, after giving it a slight turn in either direction.

8. Dry the urethra of excessive secretions by gently mopping it through the tube by means of applicators wrapped with absorbent cotton. Uncut match sticks will be found most convenient for this purpose.

9. Insert the light-carrier, and fasten it to the spur on the disc.

10. Attach the megaloscope when required.

11. Draw the tube slowly out of the urethra. As this is being done all its parts fall into view. When one requiring special investigation or treatment is met, bend the penis over the tip of the tube in the direction opposite to the side at which the point to be examined appears. This stretches the mucosa at such a point for better examination or treatment. The fourth or fifth finger of the left hand holding the penis can push the urethra still further into view.

12. As an additional safeguard, it is well to irrigate the anterior urethra after a urethroscopy, as after any other instrumentation.

POSTERIOR URETHROSCOPY.—(a) Place the patient in the position for perineal section.

(b) Perform the steps indicated above (1 to 6). When the tip has reached the compressor make gentle pressure against it; at the same time depress the tube between the thighs. Then, watching for the end of an expiration, gently thrust the tube inward and slightly upward. Usually the grasp of the compressor is felt upon the tube for an instant; immediately thereafter it can be drawn forward and backward. This should not be done brusquely lest the tip injure the very sensitive posterior urethra.

(c) Withdraw the obturator. This is usually followed by some urine.

(d) Dry the posterior urethra as much as possible with absorbent cotton wrapped about applicators, taking more care than ever to use no violence. A little blood upon the cotton is, however, not unusual.

(e) Insert the light-carrier. Even if urine trickles into the posterior urethra and out through the urethroscope, it will not extinguish the light, as it would were an uncovered, incandescent

wire employed. The posterior urethra can consequently be most deliberately examined, its secretions mopped up, and applications made under the guidance of sight.

An intravesical irrigation of potassium permanganate 1:6,000, or of boric acid four per cent., should be used after posterior urethroscopy.

Urethroscopic Diagnosis.—The recognition of urethral disturbances, like a knowledge of the urethra in health, cannot be acquired, except most laboriously, from mere descriptions. Even such graphic details as those furnished by Oberlaender, Kollmann, and Wossidlo are of use only to the urethroscopist whose eye has received some training. They then are invaluable.

Still, those who are prevented from obtaining personal instruction in the urethroscopic appearances are entitled to such guidance as is within the writer's power. To this end the following attempt is made.

The Urethra in Health.—Even when observing most scrupulous asepsis no physician will insert an instrument into a urethra which he knows to be in health. But the practitioner may avail himself, for the purpose of studying the normal urethra, of a class of neurasthenics to whose general condition urethroscopy acts as a most grateful placebo. No matter how perfect the condition of their urinary channels, nor how firm the physician is in assuring them of that fact, they are satisfied and believe themselves improved with each urethroscopic examination.

The study of urethroscopy on cadavers is absolutely useless. Circulation having ceased, the natural color and consistence of the mucosa are gone and offer no means for comparisons.

A first glance into the normal urethra shows a red glare, recalling one's initial effort at ophthalmoscopy. After some practice one learns to distinguish brilliancy, colors, folds, and striæ. The normal "central figure," as Oberlaender calls that part of the urethra which presents when the tube is held in the exact axis of the canal, merits study, as do the mouths of the crypts which later on become evident to the investigator. Under the megascopic attachment the submucous blood-vessels become visible; their normal or excessive tortuousness should receive heed.

Even with these premises it will be found that the urethra, like other organs, varies exceedingly within the limits of health.

THE NORMAL ANTERIOR URETHRA.

The *normal brilliancy* of the urethra varies in its different parts. The cavernous portion is so brilliant that it suggests disturbing reflexes. The fossa is perhaps almost as brilliant, but the paleness of its submucous tissues makes the whiteness thereof more apparent.

The *normal color* varies considerably. It may be anæmic, pale, or light pink; moderately hyperæmic, roseate to red; hyperæmic, intensely red.

The *normal folds* vary with the calibre, thickness, and consistence of the urethra. A narrow anæmic urethra shows slight folds or none at all; while a wide, thick, coarse urethra contains five to eight more or less deep folds of mucosa.

The *normal striae* appear as fine yellowish-white marks, radiating from the central figure upon the eminences of the folds. This striation is not found in all urethræ.

The *normal central figure* suggests the opening of a rubber "spring" tobacco pouch, where the distal end of the tube presses against the mucosa by its weight. Ever so slightly drawing the penis out gives this region a funnel-like appearance, leaving the "central figure" somewhat smaller, and differing in various parts of the urethra. Just behind the glans it appears as a small round or oval opening, deeper within the urethra it looks like a closed dimple, and at the bulb its lower half arches forward.

The Morgagnian Crypts.—When drawing the tube out of the urethra five to ten little shallow depressions fall into view, most of them centrally located toward the upper two-thirds of the canal. These are the openings of the Morgagnian crypts.

The megaloscopic attachment will considerably augment the apparent size of the above-described parts.

THE NORMAL POSTERIOR URETHRA.

The *caput gallinaginis* (*veru montanum, colliculus seminalis*) is usually first seen in the posterior urethra. It is about the size of a split pea, semiglobular in shape, sometimes flattened and smooth, sometimes elevated and with a furrowed surface. It is of the same red color as the surrounding mucous mem-

brane. Depressions suggesting crypts may sometimes be seen about it. These are the openings of the prostatic sinus, and of the prostatic and ejaculatory ducts.

The *sinus pocularis (uterus or utriculus masculinus)* opens at the anterior declivity of the caput gallinaginis as a fine slit. It is a little sac, of a lengthened pear shape, which passes upward and backward to the base of the prostate and ends between the ejaculatory ducts. It may be materially enlarged, so much so as to catch and arrest the progress of an instrument toward the bladder, if the instrument is not guided along the roof of the posterior urethra.

The *posterior urethral funnel* is very short.

The *lustre of the posterior urethral mucosa* is less than that lining the anterior urethra.

The *posterior urethral folds* are so shallow as often to convey the impression of their entire obliteration.

The *anterior boundary of the posterior urethra* is naturally the posterior boundary of the anterior urethra. The withdrawal of the tube marks it clearly, not only by release from the tight grasp of the compressor upon the tube, but also by the appearance of the marked folds of the bulbous portion.

Bleeding during posterior urethroscopy is not at all infrequent, especially when it is made for the first time.

URETHROSCOPIC APPEARANCES.

For the student's convenience, the appearances of the urethra are here alphabetically arranged. No pretence to anything more than a mere introduction to the study of urethroscopic diagnosis is made.

Bleeding in the posterior urethra occurs more readily than in health from mere contact with the tube in the soft infiltration of chronic posterior urethritis.

Bleeding Spots.—Where epithelial denudations have been followed by slight granulations, these bleed easily.

Blood-vessels not visible in hard infiltrations.

Brilliancy (see Lustre).

Caput gallinaginis pale, yellowish color, lacks lustre, does not project, is not wrinkled, but is flat and smooth in hard infiltration of the posterior urethra.

Central figure appears as a wide, often distorted passage in hard (dry) infiltrations.

Color, dull gray in hard infiltrations.

Cyanotic, purplish color of posterior urethra evidences soft infiltration.

Denudation, epithelial, in advanced inflammatory processes and in superficial traumatisms of the mucosa.

Desquamation, epithelial, distinct, in hard infiltrations.

Desquamation, epithelial, slight, in somewhat advanced inflammation.

Dull, dry epithelium with lack-lustre appearance, indicates subepithelial inflammation of the glands. Their orifices are then not visible.

Dull, uneven mucosa, when in the first stage of inflammation the cellular infiltration is denser than ordinarily.

Epithelial denudation, in advanced inflammatory processes.

Epithelium desquamating (see *Desquamation, epithelial, distinct and slight*).

Folds absent in hard, dry infiltrations.

Folds grosser, thicker, coarser, broader and from four to six in number instead of from eight to twelve, in more dense cellular infiltration than usual in the early stage of inflammation.

Gaping Glands.—The orifices of Littre's glands and of the Morgagnian crypts gape and are surrounded by a puffy, red, prominent wall, forming a distinct boundary from the healthy tissues, in the more severe forms of chronic gonorrhœa, with consequent infiltration around the crypts. Occasionally some secretion oozes from the orifices in this stage of urethritis mucosæ or soft infiltration.

Glands and crypts are always visible in first degree of hard infiltration as red inflamed spots.

Glands and crypts are not visible, or but very few appear, in the second variety of infiltration (dry infiltration), as their orifices are covered by epithelia and connective tissue.

Glandular Orifices.—More are visible than in health, when the mucosa is diseased. When the epithelial layer of the mucosa is destroyed, then the more deeply the mucosa is invaded, the greater is the exposed part of the glands. They appear as minute red specks, mostly in groups. When the megalo-

scope is used, the glandular form and ducts are made plainly visible.

Granulations appear on spots that have been denuded of their epithelium. They often bleed readily at contact with the margin of the tube.

Gray Color.—In hard, dry infiltrations the mucosa has a gray color.

Grayish opaque veil covers mucosa in hard infiltrations.

Hard infiltration is rare in the posterior urethra.

Hard infiltration is the outcome of transformation of cellular into fibrous infiltration. Its urethroscopic manifestations naturally vary as this transformation progresses.

Hillocky mucosa is sometimes seen in hard infiltrations. The mucosa has lost its brilliancy and may distinctly desquamate.

Infiltration, hard, rare in posterior urethra.

Infiltration, soft, frequent in chronic posterior urethritis.

Littre's glands are grouped about the Morgagnian crypts. They are ordinarily not visible in health. The experienced urethroscopist, however, employing the megaloscope, in many cases can see the mouths of the normal Littre's glands and even part of their ducts as they descend beneath the epithelium of the mucosa. The mouths of these glands may remain visible a long time after the urethra has returned to health. They may also be invisible in disease, if the pathological process occurs subepithelially. The form of disease affecting these glands, whether visible or not, shows its results upon the Morgagnian crypts.

Small red points are the mouths of Littre's glands in simple swelling.

Large red points, projecting into the urethra, show that Littre's glands are in a state of infiltrative inflammation. The fibrillary connective tissue, always present in chronic gonorrhoea, is then formed about the ducts and bodies of Littre's glands. This fibrillary connective tissue is caused by the finely granular infiltration of the acute inflammation.

Littre's glands are not visible in the dry form of hard infiltrations. In this condition the epithelium looks dull (lack-lustre) and dry, and desquamates in spots.

Lustre apparently increased by liquid (glycerin, cocaine,

mucus, urine) left on mucous lining. To prevent error, the surgeon should attempt to remove the excessive lustre by careful use of absorbent cotton attached to applicators.

Lustre decreased with increased infiltration and in epithelial desquamation, with or without infiltration. The brilliancy is entirely lost in hard infiltrations.

Lustre gone in epithelium covering glandular orifices, with dull, dry appearance of mucosa, indicates subepithelial inflammation of the glands.

Lustre increased in subacute superficial urethritis. The mucosa is congested and swollen from cellular infiltration.

Lustre of posterior urethra increased in soft infiltration.

The *Morgagnian crypts* are visible in all chronic diseases of the urethra, and are modified according to the intensity of the disease of Littre's glands. The mouth of a crypt is larger than those of the surrounding Littre's glands, often appearing as a quite evident dark-red slit. The variations from simple swelling to infiltrative inflammation are similar to those which take place in Littre's glands. When the megaloscope is used, and slight pressure made upon an opening of a crypt by bending the urethra, pus may be seen welling from the red slit. Its patency ("gaping") will then become more evident and show that it is not a tear in the urethra, but really a widely open emunctory duct.

Neoplasms.—The most frequent tumors of the urethra are papillomata and fibrous polypi. Carcinoma of the urethra is very rare. Before Oberlaender diagnosed a primary carcinoma of the urethra in 1893, the disease was only accidentally discovered in its advanced stages during an operation. Oberlaender's early discovery of this carcinoma enabled the patient to be operated upon promptly. A year later no evidence of the disease had recurred.

Opaque grayish veil covers mucosa in severer forms of infiltration.

Posterior urethroscopy is not permissible in acute or subacute posterior urethritis, in tuberculosis, or in acute prostatitis.

Prominence, reddish, within the mucosa, with a central dimple and invisible lumen, is seen when the inflammation has become follicular. The finger can feel these encapsulated crypts

as small hard nodules. Their breaking down may produce peri-urethral abscess.

Psoriasis mucosæ urethralis (Oberlaender)—see White Patches.

Purple color, of posterior urethra—see Cyanotic Color.

Red specks with swollen, puffy surroundings, occasionally exuding a watery, milky, or purulent discharge, show inflammation of the Morgagnian crypts. See also Glandular Orifices.

Resistance to urethroscopic tube as it is being introduced is felt in hard infiltrations.

Rigid Urethra.—The denser the fibrous tissue in dry, hard infiltration, the more rigid does the urethra become; in its fully developed form it shows white cicatricial tissue, spotted with groups of red orifices of Littré's glands.

Scaly and uneven epithelial layer in severe infiltrations.

Smoothness of epithelium lost in severer forms of infiltration of the mucosa.

Specks, red—see Glandular Orifices.

Specks, white—see White Patches.

Striæ, almost or quite obliterated in dense cellular infiltrations; no vestige of them remains in hard, dry infiltration. In some normal urethræ the striæ are absent.

Swelling of mucosa of posterior urethra in soft infiltration.

Transparency lost in hard infiltrations.

Tumors—see Neoplasms.

Ulcerations due to epithelial denudations of inflammatory origin are usually longitudinal. They may result from traumatism produced by excessive or violent dilatation. Ulceration of a circular tendency may be chancre or chancroid.

Uneven and dull mucosa in denser cellular infiltration, at the first stage of inflammation.

Uneven and scaly epithelial layer, in severe infiltration.

Veil.—A thin veil seems to cover the urethra in hard infiltration; in spots elevated scales present. These gradually heal.

White patches, irregular in shape from small specks to large patches, called "*psoriasis mucosæ urethralis*" by Oberlaender. Kollmann found these psoriatic pellicles to consist of cumuli of firmly agglutinated epithelial cells, whose nuclei stained distinctly with Bismarck brown. These epithelia were of polygonal pavement shape, rounded epithelia, and some high cylindrical

epithelia as are found in the prostate. The course of this psoriasis is very chronic.

NOTE: This chapter is elaborated from the report of my first public demonstration, in the *Journal of Cutaneous and Genito-Urinary Diseases* for April, 1899, and from my article in the *Journal of the American Medical Association* for September 7th, 1899.

XIV. THE PROOFS OF CURE OF GONORRHŒA.

To secure a patient who no longer presents any tangible evidences of gonorrhœa against auto-reinfection and possible infection of others, no case should be dismissed from treatment until all the tests at present known have resulted negatively in his case.



FIG. 57.—Stripping Urethra.

While most of these have been mentioned incidental to other matters, all are here placed together for the practitioner's convenience. In describing them, a note is added to each test of the errors that may thwart its purpose.

Stripping the Urethra.—Patients, especially those anxious to

demonstrate that they have recovered, squeeze the penis, sometimes quite violently, to prove the absence of a discharge. The conformation of the organ renders this method futile in bringing to view any evidence of disease, even when the urethra has an appreciable quantity that can be produced with the proper technique, as follows:

1. Rest the four left fingers upon the outer side of the left corpus cavernosum, and the left thumb upon the opposite side, thus endeavoring to approximate the corpora cavernosa to each other and exercising a pressure, as if to squeeze the urethra from between them.

2. With the bent right index finger press the peno-scrotal angle backward as far as possible to the lower margin of the pubic arch. Firmly pressing the so bent finger upward and carrying this pressure steadily forward, any moisture thus obtainable will be brought to the meatus. It is not at all rare that a large yellow, purulent drop replete with gonococci can be so stripped from the urethra long after all discharge has ceased.

A great many patients, as anxious as the first mentioned, but in the opposite direction—namely, to prove that they are not cured—acquire remarkable dexterity in maintaining an urethrorrhoea by frequent strippings of the urethra. These can, at almost all times, produce a transparent or translucent drop at the meatus. Its microscopical examination reveals mucus, urethral epithelia, and occasionally some leucocytes.

In either case, urethroscopic examination is required to determine the region or gland whence the drop comes, or to elicit, in the second category of cases, whether the drop the patient milks from his urethra is due to general excessive juiciness of the canal. In the former the treatment mentioned in Chapter IX. is applicable. But a patient who maintains the irritability of his urethra by continual milkings is more difficult to manage. Arguments and persuasion are ordinarily of little avail; the conviction that he is incurable is usually deep-rooted in his mind, and is reinforced by each milking, wherein he persists until the convincing drop is brought forth. A good method for the treatment of such cases is to irrigate the urethra with four-per-cent. boric-acid solution and to order the patient, with a view to diverting his attention from persistent milkings, to inject a drachm or two of the same solution several times daily, if he

cannot be otherwise dissuaded from the milking habit. One case, after all else had failed, was cured by the cruelty of painting the lower half of his penis with cantharidal collodion. The resultant blisters prevented his handling the organ for two weeks; then they were permitted to heal. He did not resume the milkings, but persists in the firm belief that the blistering cured him.

Possible Errors.—Stripping the urethra may fail to produce a drop or an excess of moisture from a diseased anterior urethra, if the patient has urinated within a few hours. In many cases it cannot be made evident at all, unless the examination is made in the morning, if the patient has not urinated since the night before.

If the drop cannot be stripped out during the day, and if for any reason the patient cannot be examined while his bladder holds the night's urine, the patient should be given several cover-glasses and be instructed to catch a small quantity of the morning drop upon one and press another cover-glass upon it. Thus the drop can be brought to the office for microscopical examination. The fact that one specimen is found to be free from gonococci does not prove their absence. It will always be best to make ten such examinations, two or three days apart, before finally concluding that the morning drop contains no bacteria. Even then it is by no means safe to declare the patient unable to infect others or to reinfect himself. Gonococci may be residual in some part of the urethra, and by their presence provoke the non-bacterial drop. Therefore this test cannot be accepted as final, nor can the case be pronounced cured, until all the tests here recited have proven the absence of gonococci and the healthy condition of the urethra and its adnexa.

The Urine.—Whenever possible, examination of the urine for evidences of urethral disease should be made before the patient has passed any part of his night's accumulation in the bladder. Ordinarily¹ it is assumed that the first 50 c.c. passed in the morning suffice to wash out the anterior urethra. This quantity, however, does not seem sufficient in all cases. Therefore it is best always to have the patient pass first 150 c.c. into a tube as directed (on page 25) in Chapter IV., and to pursue the other steps there directed.

Possible Errors.—On centrifuging clear urine, a deposit may

¹ Posner: Diagnostik der Harnkrankheiten, Berlin, 1895.

be obtained. If not, a few drops of alcohol added to the specimen will, on second centrifuging, throw down a slight deposit. In case this deposit, microscopically examined, shows thinned epithelium with very faint nuclei or none, the patient should be warned that an infiltration is at least beginning, and that he must be at once treated by dilatations lest he become a victim of stricture and all it portends.

Filaments, flakes, etc., have been discussed in other parts of this book (see page 144).

Ramonage.—The great master Guyon suggests this method of obtaining specimens from the deeper urethra for microscopic examinations. It consists in anointing with glycerin as large a *bougie-à-boule* as can be easily introduced. Immediately upon its withdrawal from the urethra, the substances that adhere, especially to its shoulder, are removed for examination.

This bougie may, however, fail to bring with it any pathological products. Owing to a possible excess of glycerin or an over-juicy urethra, evidences of disease may be swept from the bougie before it is entirely withdrawn. Still, in the majority of cases it will be well to examine the substances adhering to the bougie, even when the purpose of its use was only to search for infiltrations, stricture, etc.

Scraping the urethra is performed by holding a platinum loop in the alcohol or Bunsen flame until it is red hot, and, while not permitting its sterility so obtained to be impaired by contact with anything, to allow it to cool. Then, holding the penis as for stripping (*vide* Fig. 57) the cooled loop is gently passed into the urethra. As it is drawn out it is pressed against the urethral walls sufficiently to detach some of the adherent contents. They will at least fill the eye of the loop. Striking it upon a slide or upon a cover-glass furnishes a specimen for microscopical examination.

After each such scraping the loop must be thoroughly re-sterilized by flaming, lest by it the next case so examined be infected, or, at least, the specimen taken from him be vitiated.

Swabbing the Urethra.—When the urethral excess is too minute to be obtained by *ramonage* or scraping, sufficient moisture can be swabbed therefrom for examination. The swab is made by tightly wrapping a small quantity of borated cotton upon a sterilized platinum loop; then lighting the cotton in the

flame and instantly blowing it out. A light rap with the handle of the loop upon a finger will cause the charred parts of the cotton to drop off. This swab may then be used without a lubricant to obtain a specimen. Its employment is naturally limited to the anterior third or half of the urethra.

Residual Posterior Gonorrhœa—see Chapters IV., VIII., and X.

Expression Urine.—The patient is laid upon a table and the index finger, prepared as directed in Chapter XI., is well anointed and inserted into the rectum. Avoiding the prostate, the pulp of the finger presses upon the posterior urethra by stroking it firmly from above downward against the pubis. The urine accumulating during this process will contain as much evidence of posterior urethral disease as can be detached by this method.

Infection of the Prostate, Seminal Vesicles, or Cowper's Glands.—Stripping these adnexa for the purpose of obtaining specimens therefrom is described in Chapter XI.

Possible Errors.—No attempt should be made to obtain specimens from the posterior urethra or the prostate, seminal vesicles, or Cowper's glands, at the same examination, lest their contents intermingle in the urethra and thus give no positive indications regarding the region infected.

Beer Test.—A week after all evidence of gonorrhœa has ceased the patient is ordered to drink, in the evening, double the quantity of beer or champagne he was in the habit of consuming before they were forbidden him. This may, within twelve to thirty-six hours, produce a discharge, if any disturbance exists. Microscopical examination of the discharge will decide its character.

Silver and Bichloride Tests.—When the beer-test fails to produce a discharge, an irritant irrigation of the anterior urethra with silver nitrate one per cent. or corrosive sublimate 1:5,000 will evoke one, lasting from eight to thirty-six hours. If the discharge so established contains gonococci, they most probably but not positively are located in the anterior urethra.

Condom Test.—The other tests having resulted negatively, the patient is advised to use a condom at his next sexual intercourse and to bring it with its contents for microscopical examination. It is most likely to contain, in addition to semen,

some of the contents of the urethral mucosa and its glands, as well as any bacteria the reproductive apparatus may harbor. The various local tests suggested must then be employed to determine the region in which the bacteria are held.

It would go beyond the province of this effort to discuss the morality of advising a patient to cohabit or to use a condom. The majority during the acuity of their sufferings invariably forswear sexual relations during the remainder of their lives. As a rule, the more vehement their asseverations in this regard the sooner will they again seek sexual gratification, often during the period when it is still positively forbidden. With or without permission, when evidences of the disease have passed and the tests before mentioned have yielded negative results, these patients will have coitus. Is it not best to avail one's self of their immorality for their own good and the protection of their prospective wives by asking for a condom specimen?

When even the condom test has proven negative or when the physician's conscientious scruples cause its omission the final resort is

The Urethroscope (see Chapter XIII.).—If a healthy urethra is found, and its adnexa are proven to be normal, the case may be discharged.

Preparation of a Specimen for Microscopical Examination.—For the convenience of those not rendered familiar with the technique, by daily examination for gonococci, the method that is easiest and most reliable is here recapitulated:

1. Spread as thinly as possible upon a cleaned cover-glass the discharge, drop, filament, urinary sediment, or specimen taken with a sterilized platinum needle from the contents of a condom.

2. Let the specimen dry under a bell-glass, to protect it from dust or air microbes. This usually requires about three minutes.

3. Pass it three times through the opened Bunsen flame, with an even motion, to "fix" it.

4. Drop eosin (saturated solution in alcohol) upon the cover-glass and hold it over the closed Bunsen jet until a slight, visible evaporation results.

5. Hold it under a stream of water until all the eosin that can be washed away is carried off. If the cover-glass stood on

edge over filter paper gives the paper ever so slight a tinge, the washing has been insufficient, and must be repeated until nothing but clear water comes from the glass.

6. Drop two per cent. methylene blue upon the glass and let it rest there, covered, for five minutes.

7. Wash as described under 5, let it dry, and then mount it for examination.

8. Unstain by the Gram method.

Physicians who cannot devote the ten or twelve minutes to this preparation of a slide will do well merely to take the specimen on a cover-glass, place another cover-glass upon it, and send the specimen to a colleague or a bacteriological laboratory for examination.

For positive assurance culture experiments are necessary. These, however, cannot be made save by a physician provided with a laboratory fitted for the purpose.

XV. THE MARRIAGE OF GONORRHŒICS.

The question that most frequently confronts the general practitioner, as well as the specialist, concerns the marriage of those who have had gonorrhœa, and the resumption of matrimonial relations by married infractors who acquired the disease *extra domo*.

Advice in this regard cannot be lightly given. In support hereof a slight historical digression may be permitted.

E. Noeggerath,¹ of New York, in 1872 asserted, as Ricord had before him, that eight hundred men of every one thousand living in large cities had gonorrhœa. The recently deceased eminent gynecological surgeon, Mr. Lawson Tait, went further in this, claiming that every man at least once during his life acquired clap. While observation and experience compel acceptance of Tait's estimate as nearer the facts, the author can positively assert that at least one man, now almost fifty years of age, has not been so unfortunate.

Noeggerath, in the same dissertation, and in the light of the treatment then employed, asserted that men infected with

¹ Noeggerath: Die latente Gonorrhœe im weiblichen Geschlecht, Bonn, 1872.

gonorrhœa never recovered. He further insisted that ninety per cent. of these men, when they married, infected their wives. The eminent surgeon's views were fiercely combated, yet stanch in his convictions he, four years later, summarized his conclusions in a paper on the subject,¹ as follows:

"1. Gonorrhœa in the male, as well as in the female, persists for life in certain sections of the organs of generation, notwithstanding its apparent cure in a great many instances.

"2. There is a form of gonorrhœa, which may be called latent gonorrhœa, in the male as well as in the female.

"3. Latent gonorrhœa in the male, as well as in the female, may infect a healthy person either with acute gonorrhœa or gleet.

"4. Latent gonorrhœa in the female, either the consequence of an acute gonorrhœal invasion or not, if it pass from the latent into the apparent condition, manifests itself as acute, chronic, recurrent perimetritis or ovaritis, or as catarrh of certain sections of the genital organs.

"5. Latent gonorrhœa, on becoming apparent in the male, does so by attack of gleet or epididymitis.

"6. About ninety per cent. of sterile women are married to husbands who have suffered from gonorrhœa, either previous to or during married life."

Noeggerath's conclusions were based purely upon clinical experience. They were in no wise essentially controverted when three years later Neisser² published his epoch-making discovery of the gonococcus.

If Noeggerath's note of alarm needs further confirmation it is found in the statistics of the German empire for 1894. These show that of the women who died of diseases of the womb, or of its adnexa, eighty per cent. were proven to have succumbed to gonorrhœal infection. They further show that of all children who became hopelessly blind after having been born with healthy eyes, eighty per cent. went into a life of darkness from gonorrhœa. Since 1894, the Credé method of swabbing the eyes of the new-born with two-per-cent. silver-nitrate solution

¹ Noeggerath: "Latent Gonorrhœa in the Female." Transactions of the American Gynecological Society, 1876.

² Neisser: "Eine der Gonorrhœe eigenthümliche Mikrokokkenform." Centralblatt für medicinische Wissenschaften, No. 28, 1879.

has saved many eyes. And since the irrigation treatment and a clearer understanding of the dangers of gonorrhœa have become more generalized, doubtless many women are saved from infection.

It cannot for a moment be assumed that the men who caused the death of their wives or the blindness of their children married with the knowledge that they could produce such disastrous results. If there is one among the thousands who did so, no punishment known to any modern criminal code could adequately expiate his iniquity. With the ever-increasing attention given by the profession to the appreciation of the dangers of gonorrhœa, it is to be hoped that this menace to human happiness will be eventually stamped out.

It is perfectly true that many men to-day, uninformed of the seriousness of clap, boast of having had innumerable attacks of the disease and of having relieved themselves therefrom by trifling medication or advertised nostrums. It is exceedingly interesting to note that none of these boasts are made while the patient has gonorrhœa, and that he does not employ the vaunted preparations when he acquires a new attack.

The physicians and those of the public who make clap a subject of witticism are not without their influence upon the people in general. All men, however, when they have gonorrhœa, know that it was contracted from a woman, and it would be the extreme of pessimism to assert that a man, knowing that he can infect a woman, would marry. Still, it is difficult to convince such a man, after he perceives no evidence of the disease, that the danger of infecting his future wife may continue. For such it will be well to cite a typical case, couched in language within the reach of his intelligence.

Five, ten, or more years after a man had gonorrhœa, time has almost if not entirely effaced the disagreeable incident from his recollection. He marries a girl, strong and healthy. The young wife soon begins to fade. Vague pains set in. If her friends love her, she will be twitted with advice and congratulations regarding the presumed coming maternity. Her form, too, suggests such possibility. But by the time, or before, the child that is to make her still more loved by her husband is expected, it is found necessary to seek professional advice.

A cyst of the ovary, a Fallopian tube filled with pus, or

some other dangerous disease is discovered. An operation, perilous to life, must be performed to save her. If she survive, she will no longer be a woman, for she cannot become a mother. The light of modern microscopy brought to bear upon the tumor, cyst, or other substance removed reveals gonococci. Remember that this wreck, but a few short months ago a vigorous, healthy girl, was "as chaste as ice, as pure as snow." Remember, too, that her husband presented no sensory evidence of the disease that killed his cherished wife. Killed—the word is advisedly employed—for, though she live, she is worse than dead; she is not only unsexed, but also physically and often mentally destroyed.

If a patient is morally so debased that such an argument does not appeal to him, he should be made to understand what at least some of the complications and sequelæ of gonorrhœa portend to him. He will listen to the fact that gonorrhœal pus in ever so minute a quantity entering the conjunctivæ can irremediably destroy his sight within twenty-four hours. Equally will he appreciate that his testicles can be invaded, rendering him impotent to further disseminate the disease. Little as he may care for the lives of others, he can be made to understand that even long after he observes any evidence of disease, he may die from the consequences of gonorrhœa.

All these facts, impressed upon such a man, will induce him to submit to the tests that will prove whether he is cured (Chapter XIV.) and to seek treatment for the ailment, if it is discovered that he still carries the death-dealing microbes.

Ignorance of the dangers of gonorrhœa is not limited to the mentally uncultured. The highest literary universities in our land do not teach their students even the veriest rudiments of genital physiology and pathology. The editor of one of our foremost American magazines, a man of wide general scientific attainments, expressed surprise when informed of the origin, prevalence, and dangers of gonorrhœa.

The task of instructing and warning the public regarding the dangers of this ever-prevalent disease is left almost wholly to the medical profession. But such teaching can appeal only to those whose intelligence is of a grade sufficient to grasp its importance. Others can be reached only by the law.

All honor must be tributed to the legislators of Michigan,

who in their session of 1899¹ enacted that: "Any person who has been afflicted with syphilis or gonorrhœa, and has not been cured of the same, who shall marry shall be deemed guilty of a felony, and upon conviction thereof in any court of competent jurisdiction shall be punished by a fine of not less than five hundred dollars or more than one thousand dollars, or by imprisonment in the state's prison at Jackson not more than five years, or by both such fine and imprisonment in the discretion of the court."

While an adulterer or an adultress might by perjury succeed in throwing the odium of this law upon an innocent party, the fact remains that Michigan stands in the front of the world in recognizing the dangers of uncured syphilis and gonorrhœa. Naturally this enactment must have been prompted by the physicians of that State; therefore the credit thereof belongs to our colleagues. But medical men are accustomed and satisfied to see the glory of their public work go to others, when humanity at large and individuals are benefited and protected thereby.

¹ Michigan Monthly Bulletin of Vital Statistics, June, 1899.

This little book has been written to place before those physicians who may not be thoroughly familiar therewith—

1. The rationale and technique of irrigations in acute gonorrhœa.
2. The advantages of dilatations and irrigations in chronic gonorrhœa.
3. The dangers of uncured gonorrhœa, and the means of locating the foci of the disease, especially after its external manifestations have subsided.
4. To urge physicians to use their influence for the dissemination of a better understanding of the disease.

If in but one instance these purposes are accomplished, my efforts to that end will be amply rewarded.

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